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Announcements & Index

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ERRATA FOR GRA&I ISSUE 8516

The following two reports have incorrect page counts and price codes.

Bureau of Health Profession's Area Resource File (ARF) System: U.S. and Metropolitan Statistical Area Summaries of Selected Geographic Resources and Trends in Resources

HRP 0906114/4/GAR 2355pp. PC A99/MF E10

Bureau of Health Profession's Area Resource File (ARF) System: U.S. and State Summaries of Selected Geographic Resources and Trends in Resources

HRP 0906115/1/GAR 557pp. PC A24/MF A01

GOVERNMENT REPORTS

Announcements & Index

Volume 85, Number 16 August 2, 1985

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* Committee on Scientific and Technical Information

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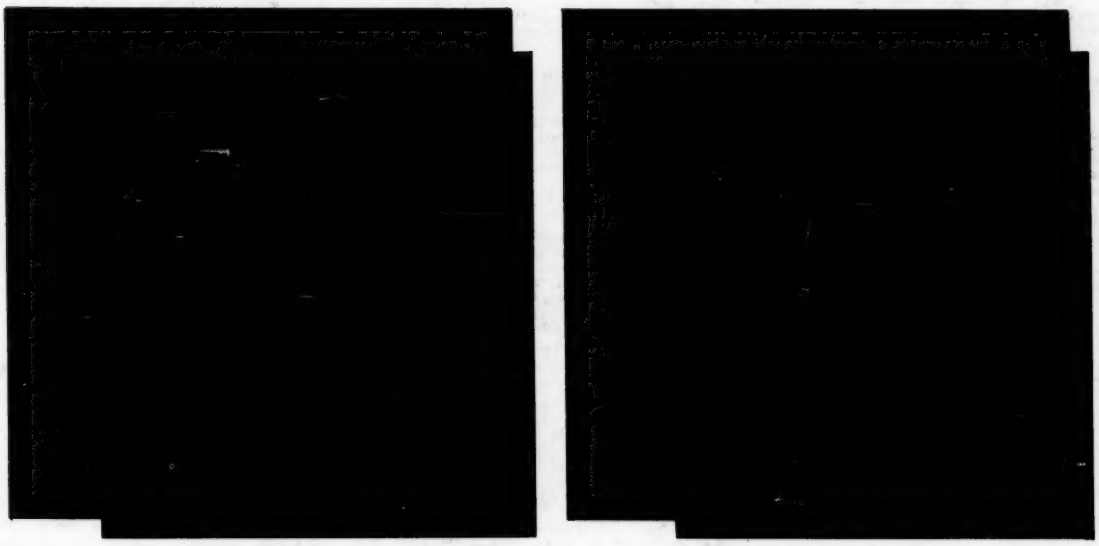

1. AERONAUTICS

1A. Aerodynamics

535,304
AD-A153 631/7/GAR PC A05/MF A01

Vrije Univ., Brussels (Belgium). Dept. of Fluid Mechanics.
Turbulence Structure in the Boundary Layers of an Oscillating Airfoil.
Final technical rept. Jan-Dec 83,
J. de Ruyck, and C. Hirsch. Dec 83, 91p Rept no. VUB-STR-14
Contract DAJA45-83-C-0021

The main objective of this work is to provide experimental information about velocity fields and turbulence structures in unsteady flows. A NACA 0012 airfoil oscillates around an axis at 25% chord distance from the leading edge, with a sinusoidal motion. Instantaneous distributions of velocity as well as all non-zero Reynolds stresses are determined in the profile boundary layers. Measurements are performed at various incidences, from non-stalled to deep stalled flow conditions. The reduced frequency is 0.3 at a chord Reynolds number of 300,000. A slanted rotating hot wire is used and the angular calibration characteristics of the wire are applied in order to detect and measure reversed flows. Instantaneous detailed flow and turbulence patterns of the periodic separation vortex are presented and discussed. These patterns are obtained from traverses at 8 chordwise positions along the suction side of the blade.

535,305
AD-A153 646/5/GAR MF A01
Air Force Armament Lab., Eglin AFB, FL.
Subsonic and Transonic Aerodynamics of a Wraparound Fin Configuration,
R. H. White, R. S. Buff, W. H. Hathaway, and G. L. Winchenbach. 15 Jan 85, 12p Rept no. AFATL-TR-85-22
Availability: Microfiche copies only.

Subsonic and transonic aerodynamic data for a wraparound fin configuration are presented. Free-flight aeroballistic tests to obtain these data were conducted at atmospheric pressure and over a Mach number

range of 0.6 to 1.35. The aerodynamic coefficients and derivatives presented in this paper were extracted from the position-attitude-time histories of the experimentally measured trajectories using nonlinear numerical integration data reduction routines. Results of this analysis indicate that a dynamic instability exists above Mach 1.0 and is related to an out-of-plane side moment which is dependent of the pitch angle. The stability boundaries associated with this side moment are mapped. Designers should consider this moment whenever wraparound fins are used.

535,306

AD-A153 758/8/GAR PC **A04/MF A01**
Analytical Methods, Inc., Redmond, WA.
Study of Aerodynamic Control in Stalled Flight Leading-Edge Vortex Formation Analysis.
Final rept. Dec 81-Aug 84,
J. K. Nathman. Feb 85, 69p AFWAL-TR-84-3090
Contract F33615-81-C-3626

This report describes the theory and application of VORSEP, a wake preprocessor for panel methods that use an iterative procedure to determine the position of strongly interacting vortex sheets. The estimation of the wake geometry is based on slender body theory with separation. An unsteady, two-dimensional airfoil program was automated with the addition of routines to interpolate cross-sectional geometry from arbitrary three-dimensional bodies, generate multi-core wakes and synthesize a three-dimensional wake structure. Leading-edge wakes for a delta, straked wing and double delta are constructed and used in VSAERO, a three-dimensional panel method. The wake structures compare reasonably well to experimentally observed vortex core positions, while calculated pressures on the wings with the estimated wakes compare well near the nose but less well near the trailing edge.

535,307

AD-A153 788/5/GAR PC **A04/MF A01**
Naval Postgraduate School, Monterey, CA.
Computational Method for Wings of Arbitrary Planform.
Master's thesis,
C. S. Jones. Dec 84, 66p

The computational method developed in this thesis permits the calculation of the aerodynamic performance of a wing of arbitrary planform. Both basic and additional lift are analyzed. This treatise is restricted to thin wings in steady, inviscid, incompressible flow. The method uses a grid system of control points over the wing semi-span. The circulation over the wing is considered variable with discrete values at the specified grid points. Finite difference equations are used to determine these discrete values. Control point indeterminacies are evaluated analytically. Matrix inversion is required for solution by the method presented. A brief summary of the principal computational relations is included. No numerical results are yet available but are expected during the next phase of this research.

535,308

AD-A153 850/3/GAR PC **A03/MF A01**
Analytical Methods, Inc., Redmond, WA.
Study of Aerodynamic Control in Stalled Flight Long Laminar Separation Bubble Analysis.
Final rept. Dec 81-Aug 84,
F. A. Dvorak, and D. H. Choi. Feb 85, 35p AFWAL-TR-84-3091
Contract F33615-81-C-3626

This report describes an analysis method for laminar separation bubbles (long or short) on two-dimensional airfoil sections at incidence. A viscous/potential flow iterative procedure was chosen due to its simple and efficient nature. The boundary layer procedure is a finite-difference method, sometimes referred to as the 'Boaz Scheme', and uses the Cebeci-Smith two-layer, eddy viscosity model for turbulence closure. The potential flow calculation in such a way that it gives constant pressure along the surface inside the bubble. The coupled calculation procedure has been applied to the NACA 64A006 airfoil and satisfactory results have been obtained.

535,309

PB85-195618/GAR PC **E03/MF E01**
Israel Aircraft Industries Ltd., Tel-Aviv.
Transonic Small Disturbance Code for Body-Wing Configuration Coupled with Full Potential Code for Wing Alone,
A. Lunt. Mar 83, 8p IAITIC-83-1001

A transonic small disturbance approximation code TSD was designed, for potential flow around a body-wing configuration. Improvements are introduced into the boundary condition representation, including the body boundary condition, the wing boundary condition and the interface between the fine grid box and the coarse grid computation. Only cartesian coordinate grids are used. The code provides good prediction of the position of the shock on the wing surface, using a comparatively small number (about 20) of grid points along the wing section cord. The TSD code is coupled with a modified Jameson FL022 code. The coupling allows detailed analysis of the body-wing interference effects in the flow.

1B. Aeronautics

535,310

PB85-191005/GAR PC **A02/MF A01**
National Center for Atmospheric Research, Boulder, CO.
Calibration of the NCAR (National Center for Atmospheric Research) Sabreliner Research Static Pressure Source with a Trailing Cone Assembly.
Technical note,
E. N. Brown. Mar 85, 21p NCAR/TN-253+EDD
Sponsored by National Science Foundation, Washington, DC.

Trailing cone results verify that pressure corrections for the NCAR Sabreliner derived from tower flyby data can be extrapolated to higher Mach numbers and higher altitudes with valid results. Residual static pressure errors are small, on the order of 0.1-0.3 mb, corresponding to altitude errors of 20-30 ft. for altitudes of 15,000-39,000 ft. and Mach numbers of 0.59-0.76.

535,311

PB85-910402/GAR PC **A03/MF A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Aircraft Accident Report - Air Continental Gates Learjet 23, Bradley International Airport, Windsor Locks, Connecticut, June 4, 1984,
5 Mar 85, 39p NTSB/AAR-85/02
Paper copy also available on subscription, North American Continent price $55.00/year; all others write for quote.

On June 4, 1984, Night Air 4, a Gates Learjet 23, N101PP, was being operated by Air Continental Inc. of Elyria, Ohio, on a cargo flight transporting cancelled bank checks. As Night Air 4 was on final approach to runway 33 at Bradley International Airport, Windsor Locks, Connecticut, several witnesses saw it level off over the approach lights and turn right. The right roll continued until the bank angle was about 90 degrees and the airplane collided with the ground. The airplane was destroyed by impact and postimpact fire. Both pilots and the one passenger on board were killed. The National Transportation Safety Board determines that the cause of the accident was an uncommanded roll to the right which caused the airplane to roll about 90 degrees and descend into the ground. The cause of the uncommanded roll was an asymmetric retraction of the flight spoilers wherein the left spoiler retracted and the right spoiler did not. The Safety Board could not determine the reason for the right spoiler malfunction.

1C. Aircraft

535,312

AD-A153 477/5/GAR PC **A03/MF A01**
Aeronautical Research Labs., Melbourne (Australia).
Comparison of Fatigue Lives under a Complex and a Much Simplified Flight-by-Flight Testing Sequence.
Technical memo.,
J. Y. Mann, and G. W. Revill. Aug 84, 40p Rept no. ARL-STRUC-TM-388

This Australian report describes Flight-by-flight fatigue tests which were carried out on specimens representing part of the front flange of the main spar of the Mirage III wing. Two loading spectra/loading sequences were used, the first being a 200-flight sequence incorporating 24 different types of flight developed by the Eidgenoessisches Flugzeugwerk in Switzerland and the second a much simplified 100-flight sequence incrporating only 4 different types of flight developed by Avions Marcel Dassault in France. The fatigue tests showed that there were no significant differences in the lives to failure between specimens tested under the two sequences, and it was therefore concluded that use of the simplified stress spectrum/sequence would not have invalidated the findings of a previous investigation to develop life-enhancement procedures for the Mirage wing main spar.

535,313

AD-A153 615/0/GAR PC **A04/MF A01**
Aeronautical Research Labs., Melbourne (Australia).
Residual Strength of Cracked Specimens Representing a Section of the Mirage IIIO Wing Main Spar.
Structures rept.,
A. S. Machin. Jul 84, 57p Rept no. ARL-STRUC-R-408

The discovery of fatique cracks at bolt holes in the wing main spar of many RAAF Mirage IIIO aircraft prompted an investigation into the residual strength of cracked specimens representing the critical section of the spar. Fatique cracks were grown at the bolt holes of the specimens, which were frequently inspected to monitor the crack length. The specimens were then broken in static tension, the fracture surfaces photographed and the lengths, depths and areas of the fatique cracks measured. Using only the data available from the non-destructive inspection made just prior to the static failure it was not possible to predict accurately the specimen residual strength though it was possible to estimate a lower bound. Crack lengths, as estimated by the NDI technique used, were close to the measured crack lengths, though usually greater. Using the measured crack lengths, depths and areas it was no possible to predict accurately specimen residual strengths, though results were better than if information obtained only by NDI were used. Fracture mechanics techniques could not be used to predict residual strengths because of a lack of suitable Stress Intensity factor solutions.

535,314

PATENT-4 505 124 Not available NTIS
Department of the Air Force, Washington, DC.
Heat Management System for Aircraft.
Patent,
A. H. Mayer. Filed 22 Sep 83, patented 19 Mar 85, 11p AD-D011 658/2, PAT-APPL-6-534 996
Supersedes PAT-APPL-6-534 996, AD-D010 635.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

A novel heat management system for aircraft is provided which is based on the aircraft fuel as the heat exchange medium and comprises a dedicated thermal reserve fuel tank for containing refrigerated aircraft fuel (or other expendable liquid) which is cooled by heat exchange with the primary aircraft fuel flow to the engines, a fuel line loop for conducting fuel through a plurality of heat exchangers associated with cooling loops for heat generating aircraft systems, and a central microprocessor based controller for controlling fuel flow and temperature throughout the fuel loop system and into the aircraft engine. (Author)

1D. Aircraft Flight Control and Instrumentation

535,315

AD-A153 623/4/GAR PC **A03/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.

Collision Avoidance for Naval Training Aircraft.
Project rept.,
J. W. Andrews, R. R. LaFrey, and J. D. Welch. 8 Mar 85, 39p ATC-125, DOT/FAA/PM-84/4
Contracts F19628-85-C-0002, DOT-FA77WAI-817

Lincoln lab was tasked by the FAA to assist the Naval Air Training Command in evaluating the feasibility of using the FAA's TCAS (Traffi Alert and Collision Avoidance System) concept as the basis of a collision avoidance system for naval training aircraft. This document summarizes the results of a brief study and flight test activity conducted to that end. It begins with a review of Lincoln Lab's. understanding of the nature of the mid-air collision problem. This is followed by a brief analysis of a set of documented collisions and near-miss encounters involving aircraft of Navy Training Air Wing 5 at Whiting Naval Air Station in Fla. in 1982 and 1983. Experience gained from FAA and Lincoln Lab. flight tests of similar encounters is reviewed and applied to the Navy encounter data base. This is follwed by review of the results obtained when a Lincoln Lab. aircraft equipped with a TCAS Experimental Unit (TEU) was flown to Whiting Field to evaluate the ability of TCAS I equipment to perform reliable surveillance in the Naval training environment. Flight test results show that the environment is quite unlike typical civil environments, but that the TCAS surveillance design would be capable of providing a significant degree of protection to Naval trainers. The aircraft types studied by Lincoln Lab. were the T-34C fixed-wing trainer and the TH-57 helicopter. These aircraft appear to be involved in the majority of the hazardous encounters reported by Naval Air Training personel.

535,316
AD-A153 810/7/GAR PC **A06/MF A01**
Applied Systems Inst., Inc., Washington, DC.
Avionics Data Base Users Manual.
Final rept.,
J. McGowan, D. J. Won, and D. Van Etten. Jan 85, 117p FAA-APO-85-5
Contract DTFA01-83-Y-30629

This manual describes the uses, structure, and operating procedures-including data retrieval, entry and special functions-for the Avionics Data Base. This data base provides detailed data for avionics currently available for both air carrier and general aviation aircraft. Specific information contained in the data base includes price, weight, dimensions, manufacture, manufacture's address and telephone number, Technical Standard Order documentation, and ATA Specification 100 data. The Avionics Data Base was created using Microrim's R:Base Series 4000 Data Base Management System on the IBM Personal Computer. It contains three files or relations as they are referred to in this document. These relations are: Avionics - the relation that contains model specifications. Manufact - the relation that contains address and telephone number for the manufacturers. TSOREF - the relation that contains the Technical Standard Order (TSO) title, location, publication date and source document(s) for each TSO. (Author)

1E. Air Facilities

535,317
AD-A153 469/2/GAR PC **A07/MF A01**
Clemson Univ., SC. Dept. of Civil Engineering.
Field Validation of Statistically-Based Acceptance Plan for Bituminous Airport Pavements. Volume 1. Correlation Analysis of Marshall Properties of Laboratory-Compacted Specimens.
Final rept.,
J. L. Burati, G. D. Brantley, and F. W. Morgan. May 84, 131p DOT/FAA/PM-84/12-VOL-1
Contract DTFA01-81-C-10057
See also Volume 2, AD-A153 470.

The laboratory phase of a three phase research effort conducted to field validate a multiple price adjustment system for bituminous airport pavements using the Marshall properties, stability, flow and air voids, is presented. The purpose of the laboratory phase was to identify whether correlations exist among the Marshall properties within individual tests. To consider the use of these properties in a multiple price adjustment system, it was first necessary to identify these correlations. The experimental design consisted of 4 different aggregate gradations and 6 different asphalt contents for a total of 24 combinations. A total of 12 replicates were tested for each combination for a total of 288 Marshall test specimens, A number of statistical analyses were conducted on the laboratory test results. An analysis of variance was conducted to determine whether time, i.e., order of testing, had an effect on the results. Correlation coefficients among the Marshall properties, i.e., stability with flow, stability with air voids and flow with air voids, were calculated for each of the 24 combinations. The results of the analysis indicate correlations that are consistent enough to violate an assumption of statistical independence among the properties. The results indicate that the effect of correlations among the properties should be taken into consideration in developing a multiple price adjustment approach based on the Marshall properties.

535,318
AD-A153 470/0/GAR PC **A04/MF A01**
Clemson Univ., SC. Dept. of Civil Engineering.
Field Validation of Statistically-Based Acceptance Plan for Bituminous Airport Pavements. Volume 2. Statistical Analysis of Marshall Properties of Plant-Produced Bituminous Materials.
Final rept.,
J. L. Burati, J. D. Seward, and H. W. Busching. May 84, 70p DOT/FAA/PM-84/12-VOL-2
Contract DTFA01-81-C-10057
See also Volume 3, AD-A153 471.

Two aspects concerning evaluation by the Marshall method of bituminous airport pavement construction were addressed. Results from field Marshall and extraction tests were analyzed to identify correlations among the Marshall properties--stability, flow, and air voids--and asphalt content and aggregate gradation, This was done to evaluate the implementation of a multiple price adjustment system based on Marshall properties, and for the development of mathematical models for estimating each property from the percent asphalt content and aggregate gradation. Data were obtained from 5 airport paving projects; however, 2 of these had such small tonnages that there were not sufficient data to prove meaningful. A moderately low negative correlation exists between stability and air voids, while no statistically significant correlation was found to exist between stability and flow. The flow and air voids correlations were not consistent among the two projects considered, with one suggesting a moderately low negative correlation, and the other no statistically significant one. The mathematical models developed for stability, flow, and air voids from extracted asphalt content and aggregate gradation were not good predictors of those properties. This is probably due to primarily to the relatively high sampling and testing variability associated with the field extraction tests.

535,319
AD-A153 471/8/GAR PC **A05/MF A01**
Clemson Univ., SC. Dept. of Civil Engineering.
Field Validation of Statistically-Based Acceptance Plan for Bituminous Airport Pavements. Volume 3. Statistical Analysis of Three Methods for Determining Maximum Specific Gravity of Bituminous Concrete Mixtures.
Final rept.,
J. L. Burati, and J. D. Seward. May 84, 85p DOT/FAA/PM-84/12-VOL-3
Contract DTFA01-81-C-10057
See also Volume 4, AD-A153 472.

Five replicates of asphaltic concrete at five asphalt contents were produced and tested to compare maximum specific gravities determined by individual constituents, by solvent immersion, and by ASTM D-2041. The effects of variations in asphalt content on the maximum specific gravities obtained by the three methods were also considered. A statistically significant difference was found to exist between the solvent immersion and ASTM D-2041 methods at all five asphalt contents; whereas, no significant difference was found between the solvent immersion and individual constituents methods. There was a significant difference between the ASTM D-2041 method and individual constituents methods. This difference varies with asphalt content. Since the solvent immersion and ASTM D-2041 methods provide statistically different results, it is not appropriate to allow the use of both methods in the same specification unless separate acceptance limits are used. It is recommended that the solvent immersion method be eliminated from use since the ASTM D-2041 procedures are much more commonly used. To avoid the use of a correction factor to convert the ASTM D-2041 values to equivalent individual constituents values, as is currently done, it is recommended that the maximum specific gravity for job mix formula determination be established by the ASTM D-2041 method.

535,320
AD-A153 472/6/GAR PC **A05/MF A01**
Clemson Univ., SC. Dept. of Civil Engineering.
Field Validation of Statistically-Based Acceptance Plan for Bituminous Airport Pavements. Volume 4. Computer Simulation of Multiple Acceptance Criteria.
Final rept.,
S. Nnaji, J. L. Burati, and M. G. Tarakji. Aug 84, 95p DOT/FAA/PM-84/12-VOL-4
Contract DTFA01-81-C-10057
See also Volume 5, AD-A153 473.

This report presents the procedures and results of a computer simulation analysis conducted to investigate the performance of 7 methods for determining the payment factor for a lot of materials when 3 correlated acceptance properties, i.e., the Marshall stability, flow and air voids, are used for acceptance purposes. The methods investigated were based upon triple numerical integration of the 3 properties, multiplying the individual property values, averaging the individual property values and using the smallest individual property value. Marshall test results from 15 runway paving projects were analyzed to determine mean, variance and correlation values obtained in field construction. Computer simulation was used to investigate the performance of the various methods for determining the payment factor for multiple acceptance properties. Simulation was used to generate Marshall test results for using population values from the 15 field projects. The mean square payment error (MSE) for each method was used as the norm and the minimum MSE as the criterion for choice among the methods. It is recommended that the average of the 3 payment factors for the individual Marshall properties be determined using the quality index approach currently employed by the FFA Eastern Region for density acceptance purposes. The payment factor for the Marshall properties can then be calculated as the average of the 3 individual property payment factors.

535,321
AD-A153 473/4/GAR PC **A03/MF A01**
Clemson Univ., SC. Dept. of Civil Engineering.
Field Validation of Statistically-Based Acceptance Plan for Bituminous Airport Pavements. Volume 5. Summary of Validation Studies.
Final rept.,
J. L. Burati, H. W. Busching, and S. Nnaji. Sep 84, 48p DOT/FAA/PM-84/12-VOL-5
Contract DTFA01-81-C-10057
See also Volume 1, AD-A153 469.

This report summarizes a research project that investigated the use of Marshall properties for acceptance purposes. Since the Marshall properties are physically related, they can be expected to be statistically correlated. It is therefore necessary to determine whether correlations should be considered when developing acceptance plans. The research consisted of 3 major phases; a laboratory analysis, field data collection and computer simulation analyses. A laboratory analysis was conducted to establish whether correlations are present among asphalt content, gradation, and the Marshall values for stability, flow and air voids. Another aspect of the laboratory analysis investigated 3 methods for determining maximum specific gravity (MSG) for air voids determination. Field data were also collected from 5 paving projects. Finally, computer simulation was used to evaluate the performance of 7 methods for determining the payment factor for the Marshall properties. It is recommended that ASTM D-2041 be used to establish MSG values for both the job mix formula and for field quality control testing. It is also recommended that the quality control testing. It is also recommended that the quality index approach be used to estimate individual PWL values for each of the Marshall properties. These PWL values can then be used with a payment schedule to determine individual payment factors for the 3 properties. The overall Marshall payment factor is then the average of the 3 individual factors.

2. AGRICULTURE

2B. Agricultural Economics

535,322
PB85-183895/GAR PC **A02/MF A01**
Agricultural Cooperative Service, Washington, DC.
Working Arrangements of Fruit and Vegetable Processing Cooperatives,
M. A. Blum. Oct 84, 23p ACS/RR-36

Organization and operations of nine working arrangements developed by fruit and vegetable processing cooperatives are described and evaluated. Three distinct approaches are identified -- contractual agreement, affiliation through membership status, and formation of separate business entity. The specific structure and functions of joint undertakings reflect the needs and preferences of the participants. Benefits perceived in the cases cited included scale economies in processing and marketing, capital cost avoidance, product diversification, assured commodity supply and enhanced market entry.

535,323
PB85-186575/GAR PC **A05/MF A01**
General Accounting Office, Washington, DC. General Government Div.
Report on the Implementation of the Farm Credit Act Amendments of 1980.
Report to the Congress,
8 Apr 85, 79p GAO/GGD-85-32, B-204456

The report is the second of two reports on the programs and activities which were authorized by the Farm Credit Act Amendments of 1980. An interim report (GAO/GGD-83-26) on the general implementation process for the 1980 Amendments was issued on March 7, 1983. GAO's final report discusses the extent that the new and expanded lending authorities in the 1980 Amendments have been used by the agricultural community and whether these amendments have resulted in the benefits anticipated when the legislation was enacted. GAO's review was made pursuant to the Farm Credit Act of 1971, as amended (12 U.S.C. 2260).

535,324
PB85-187151/GAR PC **A03/MF A01**
Idaho Univ., Moscow. Postharvest Inst. for Perishables.
Thailand: Assessment of Agro-Industry Investment Opportunities,
D. S. Leeper. Apr 82, 38p GTS-82/05, AID-PN-AAK-960
Prepared in cooperation with Agri-Food Systems International, Inc.

The attractiveness to U.S. investors of specific Thai agro-industrial enterprises are analyzed in this report on a 10-day in-country consultancy. The consultant found the investment climate in Thailand to be better than in many other developing countries. The private sector is capable and active, government intervention relatively limited, and farmers adequately productive. Agricultural potential is significant, and the country seems particularly well-situated to supply the Mideastern and Asian markets. Two specific investment opportunities were identified: vegetable seed production/processing and fruit/vegetable processing.

535,325
PB85-187185/GAR PC **A11/MF A01**
Agency for International Development, Washington, DC. Office of Evaluation.
Strengthening the Agricultural Research Capacity of the Less Developed Countries: Lessons from A.I.D. (Agency for International Development) Experience,
J. Murphy. Sep 83, 246p AID PROGRAM EVALUATION-10, AID-PN-AAL-020

Lessons learned from A.I.D.'s efforts to strengthen developing country agricultural research capacities are assessed. The assessment is based on the findings of impact evaluations of AID-funded research projects in Kenya, Central America, Korea, Guatemala, Nepal, Thailand, Tunisia, and West Africa; a review of other project evaluations; and a 6/82 AID-hosted international conference (proceedings appended). Key findings and recommendations for future A.I.D. efforts fall into four categories. First, a genuine, long-term commitment to agricultural research by the host government determines research sustainability and indirectly the use of research findings.

535,326
PB85-187193/GAR PC **A04/MF A01**
Agency for International Development, Washington, DC. Office of Evaluation.
Helmand Valley Project in Afghanistan.
Special study,
C. Clapp-Wincek, and E. Baldwin. Dec 83, 70p AID EVALUATION SS-18, AID-PN-AAL-028

The Helmand Valley Development Project in Afghanistan, a complex effort--assisted by 25 A.I.D. and predecessor agency projects (1949-79)--to settle new farmers on desert lands reclaimed by irrigation, is herein reviewed.

535,327
PB85-189835/GAR PC **A02/MF A01**
Agricultural Cooperative Service, Washington, DC.
Marketing and Transportation of Grain by Local Cooperatives, March 1985,
C. L. Hunley. Mar 85, 23p ACS/RR-47
See also PB84-207729.

A total of 2,060 local cooperative associations handled 4.7 billion bushels of grain during the 1982-83 year. This amounts to 41 percent of total off-farm grain sales. Their grain storage capacity totaled 2.5 billion bushels. Corn, at 1.5 billion bushels, ranked as the leading grain handled; wheat was second at slightly under 1.0 billion. More than half of the grain sold by local cooperatives moved by truck.

535,328
PB85-190676/GAR PC **A03/MF A01**
Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Faire Face a la Crise Alimentaire de l'Afrique (Facing the Food Crisis in Africa),
C. K. Eicher. 1983, 37p MSU/INTERNATIONAL DEVELOPMENT PAPER/WP-8, AID-PN-AAN-444
Text in French.

The food crisis in Africa, which has been worsening for the last 10 to 20 years, cannot be solved without facing many hard political, structural, and technical problems. This report provides an overview of the crisis and suggests some strategies to overcome it. African economic constraints (low population density, small-scale economies, colonial institutional heritage, agricultural emphasis, and non-cultivation of much arable land due to natural problems such as tsetse fly infestation), and the historical roots of the food crisis are outlined. Five key debates on food and agriculture which have exercised the African states during the past 25 years are reviewed: priority levels assigned to agriculture and industry in budgets and planning; the utility of western development models; the use of price and taxation policies for political objectives; capitalism versus agrarian socialism; and the effects of the Green Revolution on the African peasant.

535,329
PB85-190973/GAR PC **A02/MF A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Cropland Rental and Soil Conservation in the United States.
Agricultural economic rept.,
N. L. Bills. Mar 85, 20p USDA/AER-529

Data from USDA's Resource Economics Survey challenge the common, but not well-substantiated, view that farmers are less concerned with erosion on land they rent than on land they own. At the national level, farmers' conservation efforts--as reflected in crop rotation, tillage practices, and use of conservation practices--on rented cropland compare favorably with those on owner-operated cropland. Nevertheless, rented land is subject to more erosion because a greater proportion of it is used to produce erosive row crops.

535,330
PB85-191294/GAR PC **A03/MF A01**
Agency for International Development, Washington, DC.
Assessment of the Sahel Development Program.
Mar 83, 36p AID-PN-AAN-633

The Sahel Development Program (SDP) - a multidonor effort which grew out of drought relief activities in the early 1970's-is reviewed, with special reference to A.I.D.'s participation therein. The report specifically examines: the program's general economic effects; A.I.D. efforts in the agriculture, livestock, forestry/ecology, human resources, and health sectors; regional coordination by the Permanent Interstate Committee for Drought Control in the Sahel (CILSS) and by the Club du Sahel; program management; and the implications of economic and political change for the SDP.

535,331
PB85-191310/GAR PC **A07/MF A01**
Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Microcomputers and Programmable Calculators for Agricultural Research in Developing Countries.
Working paper,
M. T. Weber, J. Pease, W. Vincent, E. W. Crawford, and T. Stilwell. 1983, 126p MSU/INTERNATIONAL DEVELOPMENT PAPER/WP-5, AID-PN-AAN-431

The potential contribution of hand-held programmable calculators and microcomputers to agricultural research in developing countries is explored in this report, based on an international conference held in 5/82 at Michigan State University (MSU) on specific country and/or institutional issues, and on work performed by faculty and graduate students of MSU's Department of Agricultural Economics on cost-effective data collection, management, and analysis techniques. Major topics discussed include: alternative approaches to data processing; hardware and software (including strategies for software development and exchange); and institutionalization (including technical recommendations for effective field use of microcomputers in developing countries).

535,332
PB85-191344/GAR PC **A13/MF A01**
Centro Internacional de Agricultura Tropical, Cali (Colombia).
Tropical Pastures Program: Annual Report 1981.
Sep 82, 297p CIAT/SER-02ETP(1)82, AID-PN-AAM-065

In Latin America, except in temperate zones, the demand for beef and dairy products is not being met by cattle production, causing a continuous increase in real prices which affects both the diets and standards of living of lower-income persons. In this report, the International Center for Tropical Agriculture (CIAT) describes activities conducted during 1981 under its Tropical Pastures Program to increase beef and milk production. The CIAT Tropical Pastures Program focuses on interdisciplinary research in three areas--germplasm evaluation, pasture management evaluation, and pasture evaluation in farm systems.

535,333
PB85-192011/GAR PC **A08/MF A01**
Cornell Univ., Ithaca, NY.
Niamey Department Development Project: Managing Rural Development with Minimal Evidence.
Master's thesis,
M. G. Wentling. Aug 83, 175p AID-PN-AAN-828

Managers of agricultural projects in developing countries need farm-level information that is useful and timely. The large-scale efforts which are frequently undertaken to obtain this information are often costly and cumbersome to execute and may produce a large amount of information that is inconsequential to project operations. Moreover, much of the essential information generated by these efforts often arrives too late to be of use in making key project decisions. This paper uses the case of the Niamey Department Development Project in the Republic of Niger to illustrate

how a minimal amount of easily obtainable data can be adequate to implement a new project or effectively manage an ongoing program.

535,334

PB85-193795/GAR PC **A04**/MF **A01**
Foreign Agricultural Service, Washington, DC.
World Oilseed Situation and U.S. Export Opportunities, April 1985: Reference Tables on the Major Producing, Consuming, and Trading Countries of Palm Kernel Meal, and Palm Kernel Oil.
1985, 62p CIRC SUPPL-3-85
See also PB85-164218.

This publication presents, for the first time, the data base on palm kernels, palm kernel meal, and palm kernel oil. Statistical sources include Agricultural Counselor and Attache reports, official statistics released by foreign governments, and trade publications.

535,335

PB85-193886/GAR PC **A04**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Foreign Ownership of U.S. Agricultural Land Through December 31, 1984.
Staff rept.,
J. P. DeBraal, and T. A. Majchrowicz. Apr 85, 58p AGES-850320
See also PB84-186261.

Foreigners owned 14 million acres of U.S. agricultural land as of October 8, 1984. This is slightly more than 1 percent of all privately held agricultural land and 0.6 percent of all land in the United States. These and other findings are based on an analysis of reports submitted in compliance with the Agricultural Foreign Investment Disclosure Act of 1978.

535,336

PB85-194710/GAR PC **A05**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Annotated Bibliography on Agricultural Credit and Rural Savings 7: A Special Issue on India.
May 83, 93p AID-PN-AAN-843
Contract AID/csd-2501

Extensive research on rural financial issues has been done in India in recent years. This bibliography, seventh in a series, presents abstracts of 196 important rural finance studies in India, categorized as rural credit or rural savings studies, and arranged in alphabetical order by author. The section on rural credit includes 167 items (1925-83); that on rural savings lists 29 (1954-81). An author and organization index is also provided.

2C. Agricultural Engineering

535,337

PB85-185221/GAR PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Resources Community and Economic Development Div.
Federal Insurance Program for Grain Warehouse Depositors--Issues and Information.
1 Mar 85, 50p GAO/RCED-85-39, B-217659

Grain warehouse insolvencies can result in financial losses to farmers and other customers--losses that can adversely affect the individuals and local communities involved. The House Agriculture Committee's Ad Hoc Subcommittee on Grain Elevator Bankruptcy recommended various actions designed to help prevent failures and aid in the recovery of losses and suggested that GAO further study the concept of federal deposit insurance protections. This report considers patterning a grain deposit insurance program after the Federal Deposit Insurance Corporation Program and describes the FDIC Program.

535,338

PB85-187037/GAR PC **A03**/MF **A01**
National Association of Schools of Public Affairs and Administration, Washington, DC.
Working Group as a Mechanism for Managing Bureaucratic Reorientation: Experience from the Philippines,
D. C. Korten. May 82, 36p NASPAA/WP-4, AID-PN-AAK-996
Contract AID/DSAN-CA-0180

To introduce a participatory approach to working with farmer-owned irrigation systems, the Philippine National Irrigation Administration (NIA) established in 1976 a special working group known as the Communal Irrigation Committee. This working paper analyzes the Committee's role in the NIA, with special attention to its unique characteristics, its mode of functioning, and the nature of its support systems. Headed by a key NIA official, the Committee is an informal and nonbureaucratic coalition of committed professionals, many from outside the NIA. Critical to the Committee's success has been its focus, through the provision of special training, research, technical assistance, community organizers, etc., on field work in conjunction with farmer beneficiaries. Support from donors, particularly the Ford Foundation, has lent credibility to the Committee's innovations, enabled it to develop new capacities in collaborating institutions, and provided it with an independent and flexible source of funding and staff help in facilitating acceptance of the Committee.

535,339

PB85-187219/GAR PC **A12**/MF **A01**
Agency for International Development, Washington, DC. Office of Evaluation.
Irrigation and A.I.D.'s (Agency for International Development) Experience: A Consideration Based on Evaluation.
D. I. Steinberg, C. Clapp-Wincek, and A. G. Turner. Aug 83, 266p AID PROGRAM EVALUATION SS-8, AID-PN-AAL-019

Lack of good management is the principal reason that most irrigation projects have failed to reach their potential. Thus concludes this review of A.I.D. irrigation projects, based on impact evaluations, other studies, and a 5/83 AID-sponsored conference on irrigation management. Included are discussions of types of irrigation systems; social and economic impacts; policies and investment strategies; management; maintenance and rehabilitation; and project planning, monitoring, and sustainability. Although irrigation normally improves yields, it is not a simple solution to food deficits. Socioeconomic impacts (on, e.g., civic participation, women, the environment) are difficult to assess. Irrigation systems range along a continuum from local management to external control. The former is most effective, yet traditional community-based systems are often ignored in policy considerations.

535,340

PB85-191328/GAR PC **A07**/MF **A01**
Minnesota Univ., Minneapolis.
Tanks of South India (A Potential for Future Expansion in Irrigation).
Economic rept.,
K. Palanisami, and K. W. Easter. Jun 83, 149p ER83-4, AID-PN-AAN-638

The potential for modernizing and improving tank (small reservoir) irrigation in the Indian state of Tamil Nadu is assessed. After reviewing tank irrigation in Tamil Nadu and the problems affecting its performance, the report examines irrigation in the drought-prone Ramanathapuram District (where there is a large concentration of tanks), focusing on climate and rainfall, irrigation sources, soil conditions, land use and cropping patterns, and farm labor. Data collected via interviews with farmers and officials on the characteristics and performance of 10 tanks of varying dimensions in the District are presented.

535,341

PB85-192052/GAR PC **A04**/MF **A01**
Minnesota Univ., St. Paul. Dept. of Agricultural and Applied Economics.
Socioeconomic Issues in Irrigation Development and Distribution.
Economic rept.,
K. W. Easter, and D. E. Welsch. Apr 83, 69p ER83-5, AID-PN-AAN-486

Socioeconomic problems facing irrigation planners and managers are examined in this review of the literature on irrigation in India, Pakistan, Thailand, and Egypt. Focus is on three critical areas: water allocation; institutional arrangements for irrigation management; and investment alternatives.

2D. Agronomy and Horticulture

535,342

AD-A153 522/8/GAR PC **A03**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Linear Models for Field Trials, Smoothing, and Cross-Validation.
Technical summary rept.,
P. J. Green. Dec 84, 28p Rept no. MRC/TSR-2779
Contract DAAG29-80-C-0041

Spatial methods for the analysis of agricultural field experiments are represented here as smoothing methods applied simultaneously with the estimation of treatment effects. Selection of both the form of the smoother and the degree of smoothing required may be based on cross-validation. Particular emphasis is placed in this paper on generalized least-squares estimation ion linear models, but the principle applies quite generally.

535,343

AD-A153 635/8/GAR PC **A02**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Environmental Impact Research Program. A Low-Cost Transplanting Technique for Shoalgrass (Halodule wrightii) and Manatee Grass (Syringodium filiforme).
Final rept.,
M. S. Fonseca, W. J. Kenworthy, K. M. Cheap, C. A. Currin, and G. W. Thayer. Jan 85, 20p Rept no. WES/IR/EL-84-1
Sepersedes report dated Sep 84, AD-A149 479.

A simplified, low-cost transplanting technique has been developed for seagrasses, Halodule wrightii and Syringodium filiforme, for use in high- and low-current regimes. The method makes use of mature, vegetative shoots, free of sediment and anchored to the substrate. The technique accounts for selection of planting stock, species growth rate, and depth of planting site for estimating the design, labor, and material requirements of a transplant. Examples are provided to illustrate use of the tables and formulas for computing the necessary requirements. A cooperative research program has developed low-cost transplanting techniques for the subtropical seagrass species shoalgrass (Halodule wrightii) and manatee grass (Syringodium filiforme). The transplanting techniques presented are effective for: restoring areas damaged by coastal engineering activities, habitat enhancement and sediment stabilization. The technique involves planting a relatively sparse array of sprig bundles over a barren area. Lateral rhizome growth from these bundles results in creation of a characteristic meadow. This technique is estimated to result in substantial labor reductions compared to plug or fiber-mesh methods recommended in a previous report by Phillips (1980).

535,344

PB85-181915/GAR PC **E04**/MF **E04**
Agricultural Research Council, Oxford (England). Weed Research Organization.
Activity and Late Post-Emergence Selectivity of FBC 32197.
Technical rept.,
W. G. Richardson, T. M. West, and G. P. White. Nov 83, 28p ARC/WRO/TR-72, ISBN-0-7084-0289-5

FBC 32197 was examined for post-emergence selectivity on 44 crop and weed species. Its route of action was determined on six selected species in a separate test. The safener 1,8 naphthalic anhydride (NA) was used as a seed dressing on wheat, barley and maize to see if herbicide effects could be reduced. FBC 32197 showed outstanding potential control of many grass weeds, including volunteer cereals, in onion and most broad-leaved crops. All broad-leaved weeds were resistant however. Festuca rubra and Poa annua were the two most resistant grasses but the latter species showed some susceptibility to the higher doses.

535,345

PB85-181972/GAR PC **E03**/MF **E03**
Agricultural Research Council, Oxford (England). Weed Research Organization.

Potential of Various Herbicides for Selective Control of Weed Grasses and 'Stellaria media' in Newly Sown Ryegrass/Clover Leys and Ryegrass Seed Crops.
Technical rept.,
F. W. Kirkham. May 83, 25p ARC/WRO/TR-70, ISBN-0-7084-0264-X

In two autumn-sown field experiments, several herbicides were sprayed either pre- or early post-emergence onto monoculture plots of perennial ryegrass (Lolium perenne L.), white clover (Trifolium repens L.), Poa annua L., Poa trivialis L., Alopecurus myosuroides Huds. and Stellaria media (L.) Vill. Pre-emergence treatments of both metamitron and bifenox showed large margins of selectivity between ryegrass and the two Poa spp., whilst metamitron was only slightly less effective against A. myosuroides than was the standard herbicide, ethofumesate. Pre-emergence asulam controlled P. trivialis with little effect on clover and only a transient depression in ryegrass growth, but was ineffective against P. annua. White clover was very tolerant of prosulfalin but this herbicide showed only a small margin of selectivity between perennial ryegrass and the two Poa spp. Difenzoquat, applied post-emergence, was as effective as post-emergence ethofumesate, against P. annua, but with both herbicides a high dose was needed to achieve adequate control.

535,346
PB85-183135/GAR PC **E04**/MF **E04**
Institute of Hydrology, Wallingford (England).
Analysis of Digital Radar Data from SAR-580 in Relation to Soil/Vegetation Moisture and Roughness,
K. Blyth. Nov 84, 32p IOH-93

A comprehensive survey of soil and vegetation characteristics was undertaken in two test areas in southern England to evaluate the capabilities of digitally processed X and L band radar for detecting spatial and temporal variations in soil moisture. One test area (GB6) lay on homogeneous clay soils and here test sites were chosen to sample vegetation densities on a range of slopes and aspects relative to the radar look direction. The other area (GB12) was of mixed soils and varying subsurface permeability. This report describes field sampling methodology, digital data extraction techniques, radiometric balancing of digital data and the effects of soil and vegetation moisture and roughness on radar relative backscatter.

535,347
PB85-187029/GAR PC **A06**/MF **A01**
Agency for International Development, Washington, DC. Office of Evaluation.
Social Impact of Agribusiness: A Case Study of Alcosa in Guatemala.
Special study,
K. C. Kusterer, M. R. Estrada de Batres, and J. X. Cuxil. 1981, 103p AID EVALUATION SS-4, AID-PN-AAJ-172
Contract AID-LAC-C-1399

ALCOSA, a large agribusiness in Guatemala was evaluated favorably by A.I.D. in 1977, but subsequently criticized by others as having unexpected negative social impacts. This review attempts to resolve this ambiguity. ALCOSA's growth, operations, and its impacts - at the company processing plant and in three cauliflower-producing highland towns - are discussed. By 1980, due to organizational and technical problems, ALCOSA was facing an operating crisis. Vegetable purchasing had outstripped the company's capacity to control and administer it, leading to a breakdown in field organization, temporary suspension of purchases, and losses for 300 to 400 of the 2,000 small farmers involved. In addition, field employees had defrauded farmers. There have, however, been several positive effects, including at the village level: increased use of credit and investment in farm equipment; much new agricultural know-how; improved living standards; and a shift from cultivating a variety of vegetables to concentration on cauliflower and broccoli and a related appreciation of the efficiency of marketing large quantities of produce to a commercial purchaser as opposed to small time-consuming local sales.

535,348
PB85-187664/GAR PC **A02**/MF **A01**
Agricultural Research Service, Beltsville, MD.
Plot Planter for Small-Seeded Vegetables,
W. J. Conley, and W. Waycott. Feb 85, 10p ARS-17

A commercial, hand-pushed planter was modified to plant small amounts of uncoated lettuce seed in test plots. It gave an average 37% acceptable spacing in rigid laboratory and field trials versus 32% for the planter used previously. Detailed specifications and drawings are included. With appropriately modified seed plates, the planter should be versatile enough for other small-seeded crops.

535,349
PB85-191260/GAR PC **A99**/MF **E03**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Report of a Workshop on Cropping Systems Research in Asia Held at Manila on 3-7 March 1980.
1982, 735p AID-PN-AAL-972

A Cropping Systems Conference, held in March 1980 at the International Rice Research Institute (IRRI), served as a forum for disseminating to 90 researchers and extensionists the results of recent research performed by the Asian Cropping Systems Network's Working Group. The Conference proceedings, herein presented, contain 60 papers covering a wide range of farmer-focused research which has resulted in workable cropping patterns acceptable to Asian farmers. Introductory and background remarks are followed by reports grouped according to the following topics: establishment of upland crops before and after rice; dry seeding of rice; cropping pattern testing; technologies in insect management, weed science, varietal testing for intensive cropping, and cropping systems economics; and technology adoption.

535,350
PB85-191278/GAR PC **A21**/MF **A01**
Asian Vegetable Research and Development Center, Tainan (Taiwan).
Sweet Potato: Proceedings of the International Symposium (1st) Held at Tainan, Taiwan, 1982,
R. L. Villareal, and T. D. Griggs. 1982, 482p AVRDC/PUB-82/172, AID-PN-AAM-078

The high-yielding, adaptable sweet potato, an underrated crop grown principally in Asia, was the subject of an international symposium held in Taiwan in 1982. At the symposium's six sessions, proceedings of which are herein presented, 44 papers were delivered covering topics such as the status of sweet potato cultivation in the tropics (including parts of Africa); the sweet potato's use as a supplemental staple food and its nutritive value; aspects of crop growth such as root tuberization, carbon assimilation, dry matter and yield characteristics, and photosynthetic activity; crop diseases and disease control methods; crop production, including such areas as the physical factors affecting yield, nitrogen topping, and intercropping; the breeding of newer, more disease-resistant, and more nutritious varieties; and various aspects of crop processing, marketing and use.

535,351
PB85-191336/GAR PC **A18**/MF **A01**
Centro Internacional de Agricultura Tropical, Cali (Colombia).
Bean Production Problems: Disease, Insect, Soil and Climatic Constraints of 'Phaseolus vulgaris',
H. F. Schwartz, and G. E. Galvez. Jan 80, 415p CIAT/SER-09EB(1), ISBN-84-89206-00-7, AID-PN-AAM-072
Errata sheet inserted.Color illustrations reproduced in black and white.

Many factors--including diseases, insects, soil problems, climatic stresses, and poor agronomic practices--contribute to the large gap between actual and potential yields of the dry or common bean (Phaseolus vulgaris). In Latin America, for example, average yields are less than 600 kg/ha although in temperate areas of the region and in other parts of the world, average yields of up to 1,400 kg have been attained under conditions of intensive production. Even in those zones, however, yields have leveled off or even declined, largely due to complex production problems. On the other hand, many cultivars currently grown and breeding materials being developed may yield much more than 2,000 kg/ha under experimental conditions.

535,352
PB85-191831/GAR PC **A02**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Comparative Analysis of Cropping Systems: An Exploratory Study of 14 Rainfed Sites in the Philippines.
Research paper series,
T. R. Paris, E. C. Price, and S. K. Jayasuriya. Nov 82, 20p IRPS-83, AID-PN-AAL-860

The adaptation of cropping systems to the environment has been identified as a vital need. This study discusses the use of various multivariate statistical techniques to examine cropping system--environment interactions. Data, collected at 14 sites in four agroclimatic zones in the Philippines, were analyzed using tabular analysis, multiple regression, factor analysis, and discriminant analysis techniques. All techniques showed that biophysical factors are the dominant influence determining the number of crops grown in sequence and the duration of land use by crops, while farm-level socioeconomic variables are less influential. The study showed that the complexity of components within farming systems makes it necessary to use multivariate statistical techniques to understand the underlying relationships. Single equation multiple regression models, while inadequate by themselves, can be used to understand how site-level factors are combined with farm-level system characteristics.

535,353
PB85-194355/GAR PC **A03**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Major Weeds of Rice in South and Southeast Asia,
K. Moody. 1981, 45p AID-PN-AAM-447
Sponsored by Ford Foundation, New York, United Nations Development Programme, New Delhi (India) and Rockefeller Foundation, New York.Color illustrations reproduced in black and white.

Rice weeds in South and Southeast Asia can be identified by reference to published floras, but these are not widely available and many are out of date. This booklet provides information and illustrations to help scientists, extensionists, and students visually identify the major weeds that limit rice yields in the two regions. A total of 32 weed species in 12 families are listed alphabetically along with brief descriptions of their leaves, inflorescence, fruits, seeds, and propagation. Each listing is accompanied by color photographs.

2F. Forestry

535,354
AD-A153 447/8 Not available NTIS
National Oceanic and Atmospheric Administration, Oak Ridge, TN. Atmospheric Turbulence and Diffusion Div.
Seasonal Variations in the Radiation Regime within an Oak-Hickory Forest,
D. D. Baldocchi, B. A. Hutchison, D. R. Matt, and R. T. McMillen. 1984, 16p ARO-17692.4-GS
Contracts DE-AC05-760R0033, MIPR-ARO-115-04
Availability: Pub. in Agricultural and Forest Meteorology, v33 p177-191 1984 (No copies furnished by DTIC/NTIS).

Seasonal variations in solar elevation, canopy phenology and leaf pigmentation result in a dynamic variation in the radiation regime within a deciduous forest. Measurements of several isolation components taken within an east Tennessee oak - hickory forest during eight combinations of season and phenological conditions of the canopy are presented. Isolation measurements were made with instruments mounted on a moving tram system at seven levels within, and at one level above the canopy. The attenuation of solar radiation is least during the leafless phenoseason since only woody biomass is present to intercept and absorb it. Net radiation is attenuated to a greater extent than shortwave and photosynthetically active radiation, which are attenuated to a similar degree, since the sparse woody biomass does not effectively trap the outgoing reflected and radiated radiation. Solar elevation did not influence the attenuation of isolation within the leafless forest under the conditions studied. Keywords include: Isolation, Deciduous Forests, Solar Radiation, Seasons, Forest Canopy.

535,355
PB85-183077/GAR PC **A02**/MF **A01**

Southeastern Forest Experiment Station, Asheville, NC.
Selected Forage Values of Understory Plants in Thinned Cove Hardwoods on Three Sites.
Forest Service research note,
R. F. Harlow. Feb 85, 9p FSRN/SE-328, SE-85-4

The leaves and twigs of red maple, sourwood, flowering dogwood, yellow-poplar, grape, the aboveground parts of Christmas fern, and parts of several species of nonfleshy fungi were collected during August at three cove hardwood sites in the Southern Appalachian Mountains and compared for crude protein, moisture content, and in vitro dry matter digestibility (IVDMD). Leaves of the woody plants were higher in crude protein and IVDMD than twigs of the same species. Variability in selected forage values was large and overall nutritional levels were similar across the three areas. The amount of protein in leaves was above maintenance requirements for deer.

535,356
PB85-184364/GAR PC A02/MF A01
Intermountain Forest and Range Experiment Station, Ogden, UT.
Application of Discrete Optimization for Developing Economically Efficient Multiple-Use Projects.
General technical rept.,
J. G. Jones, and E. G. Schuster. Mar 85, 22p FSGTR/INT-178

A discrete version of the continuous joint production model in economic theory is presented for use in designing multiple-use projects and identifying efficient management prescriptions for forest planning. Data requirements are less demanding than the continuous theoretical model, yet some of the more important features are maintained. Models can be formulated graphically or as mixed-integer programming problems that are easily solved via computerized routines.

535,357
PB85-184901/GAR PC A10/MF A01
Fluor Engineers, Inc., Irvine, CA. Environmental Services Dept.
Noise Exposure Quantification Analysis for Forest Fire Fighters.
Technical rept. (Final) Sep 83-Nov 84,
A. Gharabegian, K. M. Cosgrove, J. R. Pehrson, and T. D. Trinh. Nov 84, 202p FLUOR/ESD-84/1
Sponsored by Forest Service, Arcadia, CA.

The purpose of this study was to quantify noise exposures of USDA Forest Service personnel while fighting forest fires. Noise-producing equipment items used to fight forest fires were inventoried and typical noise levels for each item were determined using measured or published data. These equipment were; chain saws, portable generators, portable fire pumps, air compressors, tool grinders, backfiring pistols, bulldozers, tankers, air tankers, and helicopters. Scenarios were developed to simulate actual fire fighting activities and noise exposures. Multivariate statistical analyses were performed to evaluate noise exposures of various fire fighting crews based on scenarios of typical operations performed by these crews.

535,358
PB85-186203/GAR PC A03/MF A01
Intermountain Forest and Range Experiment Station, Ogden, UT.
Predicting Duff and Woody Fuel Consumed by Prescribed Fire in the Northern Rocky Mountains.
Forest Service research paper,
J. K. Brown, M. A. Marsden, K. C. Ryan, and E. D. Reinhardt. Mar 85, 29p FSRP/INT-337

Relationships for predicting duff reduction, mineral soil exposure, and consumption of downed woody fuel were determined to assist in planning prescribed fires. Independent variables included lower and entire duff moisture contents, loadings of downed woody fuels, duff depth, National Fire-Danger Rating System 1,000-hour moisture content, and Canadian Duff Moisture Codes. Results apply to a number of mesic forest cover types.

535,359
PB85-187011/GAR PC A09/MF A01
Department of State, Washington, DC.
Draft Environmental Profile on Jamaica,
S. M. Braatz. May 82, 181p AID-PN-AAK-974
Contract AID-RSSA-SA/TOA-77-1

Despite its great physical beauty and considerable natural resources, Jamaica is plagued by debilitating economic, demographic, and environmental problems, according to this draft environmental profile. After a general description of Jamaica's geography, climate, population characteristics, political structure, and economy, discussion is given to the mining industry and the country's limited energy resources. Next, the status of renewable resources, including agricultural land, soils, vegetation, rangeland, forests, water, natural areas and wildlife, is reviewed. A final section on environmental quality notes the serious pollution and eutrophication caused by inadequate disposal of human and industrial wastes in Jamaica's coastal waters.

535,360
PB85-188126/GAR PC A14/MF A01
Southeastern Forest Experiment Station, Asheville, NC.
Proceedings of the Rusts of Hard Pines Working Party Conference (1984), S2.06-10 Held at Athens, Georgia.
J. Barrows-Broaddus, and H. R. Powers. 11 Apr 85, 310p SE-85-7
Sponsored by International Union of Forestry Research Organizations. Prepared in cooperation with Georgia Univ., Athens.

Twenty-eight papers summarizing current research progress in various aspects of managing rusts including genetic techniques, biology and control.

535,361
PB85-192177/GAR PC A07/MF A01
Agency for International Development, Washington, DC.
Comparative Advantages and Disadvantages of Root Trainers, Dibble Tubes, Plastic Bags and Bare-Rooting.
Technical series no. 4,
M. D. Benge. 29 Jun 82, 132p AID-PN-AAL-348
Portions of this document are not fully legible.

Traditional methods of growing tree seedlings are often costly and deleterious to plant growth and survival. This compilation of nine illustrated papers presents new technologies for seedling culture currently undergoing successful trials worldwide. Nurseries in developing countries commonly use either the bare root process or plastic bags for growing tree seedlings. With these methods, susceptibility of the seedlings to transplant shock is high. Modern containerization in the form of root trainers and tubes is suggested by the authors as an alternative root culture method. While initially more costly, over the long term it is advantageous in reducing seedling mortality and transportation difficulties.

535,362
PB85-194942/GAR PC A11/MF A01
Agency for International Development, Washington, DC.
Selected Tree Seed Sources in Australia, India, Holland and the United States.
Technical series no. 1,
M. D. Benge. 1 Jun 82, 230p AID-PN-AAL-394

The quality and orientation of a country's reforestation efforts depend on the availability and use of good plant material and seed. This compilation of seed sources, consisting of correspondence and catalogs from Australia, India, Holland, and the United States, was designed to identify experimental and commercial seed for reforestation of problem sites in Haiti. It is noted that seed performance depends on genetic capability and site characteristics; that tree propagation by vegetative means is useful but not always successful in supplementing seed use; and that seed selection by size and specific gravity, proper seed storage, and use of appropriate fertilizers to promote nitrogen production can increase germination percentages.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

535,363
AD-A153 717/4/GAR PC A02/MF A01
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
SAOC (Smithsonian Astrophysical Observatory Catalog) and the AGK3.
Journal article,
L. G. Taff, and S. A. Stansfield. Dec 82, 10p JA-5322, ESD-TR-85-066
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in The Astronomical Jnl., v87 n12 p1884-1890 Dec 82.

An analysis of a comparison of the AGK3 with the SAOC is presented. Stars in common to both catalogs, with both matching BD numbers and a positional (proper motion) difference of at most -2.5 deg 2.5 in.(2.5in/cent), provide the raw data. There are 128998 (129744) such stars north of declination -2.5 deg. The results presented here are position-independent comparisons, along with the time dependence of these quantities, a classical analysis of the variation of these differences over the Northern hemisphere, and a position-independent exploration of color index and magnitude effects. In addition, an analysis of the above quantities based on an expansion of the systematic differences in a complete set of orthonormal basis functions is discussed. The results are examined by statistical means and the significant expansion coefficients tabulated. Tables of the systematic differences are also included.

3B. Astrophysics

535,364
AD-A153 555/8/GAR PC A02/MF A01
Air Force Geophysics Lab., Hanscom AFB, MA.
Radial Velocity Measurements of the Sun made with a Birefringent Filter,
L. J. November. Sep 84, 17p Rept no. AFGL-TR-85-0073
Pub. in Small-Scale Dynamical Processes in Quiet Stellar Atmospheres, p74-87 Sep 84.

A Simple technique is presented for making velocity measurements on the sun. This uses two simultaneous images formed at the exit of a Lyot birefringent filter made by substituting the final polarizer in the filter with a Wollaston polarizing beam splitter. With the Wollaston axes of polarization at 45 deg. with respect to the axis of the polarizer for nominal filter tuning on a spectral line the two images primarily represent intensity in wavelengths equal distance on either side of the line. The images are recorded photographically and digitized in registration with respect to the common image field stop; I measure that the frame registration is better than 0.025 arcseconds on the sun across its field. Since the two images are simultaneous they can be directly subtracted without differences due to seeing. I present a new method for fitting the density-intensity calibration of the film and demonstrate its effectiveness in providing a linear measure of intensity and a well defined measure of velocity.

535,365
AD-A153 558/2/GAR PC A02/MF A01
Air Force Geophysics Lab., Hanscom AFB, MA.

Granulation Data Set,
R. B. Dunn, and G. E. Spence. Sep 84, 4p Rept no. AFGL-TR-85-0072
Pub. in Small-Scale Dynamical Processes in Quiet Stellar Atmospheres, Sacramento Peak Observatory, Sunspot, NM, p88-89 Sep 84.

The Multiple Diode Array (MDA) was used to obtain a data set on granulation that is suitable for image restoration and correlation tracking studies as well as for studies of the time variation of granules and filigree. The (MDA) operates a thin RCA 320 x 512 CCD array so that individual pixels and areas may be selectively digitized. The time series reported here uses a raster of 130 x 132 pixels with each pixel equal to 0.11 arc seconds (about half the telescope resolution) for a total field of 14.3 arc seconds. The exposures are 4 milliseconds and the interval between frames s 0.55 seconds. The July 17, 1983 observing run is especially good in that the seeing was excellent and the run lasted over one hour. The time series was taken in order to develop correlation-tracking techniques, frame-sharpness selection criteria and methods for destretching the scene. The series can also be used for studying granulation and filigree.

535,366
AD-A153 561/6/GAR PC **A02/MF A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Average Solar Granule,
R. C. Altrock, S. Musman, and M. C. Cook. Sep 84, 13p Rept no. AFGL-TR-85-0071
Pub. in Small-Scale Dynamical Processes in Quiet Stellar Atmospheres, Sacramento Peak Observatory, Sunspot, NM, p130-140 Sep 84.

High-resolution photographic spectra of the center of the solar disk have been obtained with the Vacuum Tower Telescope at Sacramento Peak Observatory. A weak iron line and the neighboring continuum were recorded with 40 sec time resolution and better that 1 in. spatial resolution over a period of 37 min. Intensity and velocity fluctuations were obtained in the line and continuum as a function of time and space, and 300 sec oscillations were filtered out. The resulting fluctuations, due solely to granulation, were assembled into an ensemble average of the center of a granule and the center of an intergranular lane, as a function of time. We find that the line parameters are distinctly out of phase with continuum brightness, so that, for example, maximum brightness at line center occurs approximately 140 sec prior to maximum continuum brightness.

535,367
AD-A153 572/3/GAR PC **A02/MF A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Line Asymmetries of Partially Resolved Granular Profiles,
S. L. Keil. Sep 84, 9p Rept no. AFGL-TR-85-0070
Pub. in Small Scale Dynamical Processes in Quiet Stellar Atmospheres, p148-156 Sep 84.

A time series of high-spatial resolution spectrograms made in the solar photospheric line Fe I 5576 is used to extract line profiles formed in bright granular regions and dark intergranular lanes. We form various mean profiles to generate representative granular and intergranular profiles. The asymmetry of these mean profiles are compared with asymmetries predicted from models of the granulation flow. The observations are compatible with penetrating convective elements having velocity scale heights of approximately 100km in the photosphere.

535,368
AD-A153 579/8/GAR PC **A02/MF A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Observations of High Frequency Waves Using a CCD Array,
P. A. Metroy, and S. L. Keil. Sep 84, 13p Rept no. AFGL-TR-85-0074
Pub. in Small-Scale Dynamical Processes in Quiet Stellar Atmospheres, p19-29 Sep 84.

We measured phase shifts between line displacement fluctuations at various intensity levels in Fel 5576 and 6302 for frequencies up to 40 mHz. Waves with frequencies between 4.2 mHz and 10 mHz are propagating upwards with propagation velocities near the sound speed. The amplitude of the fluctuations corresponds to about 100 m/sec. Although we measure power in the fluctuations above 10 mHz, the phase shifts drop to zero for higher frequencies. Earlier observations report that the phase shifts drop to zero above 8 mHz. This suggests that we have achieved higher resolution and better image stability and that the high frequency cutoff observed in phase shifts results from atmospheric and instrumental seeing. We find some evidence for periodic ripples in the high frequency tail of temporal power spectra of the line displacements, but these could result from atmospheric and instrumental effects. Keywords include: Solar absorption lines, Solar velocity fields, and Wave motions.

535,369
AD-A153 580/6/GAR PC **A02/MF A01**
California Univ., Berkeley. Space Sciences Lab.
Characteristics of the White-Light Source in the 1981 April 24 Solar Flare,
S. R. Kane, J. J. Love, D. F. Neidig, and E. W. Cliver. 1 Mar 85, 6p AFGL-TR-85-0068
Contract F19628-83-K-0018, Grant NAG5-376
Pub. in the Astrophysical Jnl., v290 pL45-L48, 1 Mar 85.

The 'white light' flare on 1981 April 24 (about 1358 UT) was very well observed in the continuum emissions at the optical, hard X-ray, and radio wavelengths. The time-intensity profiles of the three emissions are basically similar to each other. Impulsive and gradual components can be clearly identified in all the three types of emission. A good temporal relationship is observed between the impulsive hard X-ray and white-light emissions. The relationship between the gradual hard X-ray and white-light emissions, however, is relatively poor. A model in which the whit-light emission is produced nonthermally in the upper chromosphere through the energy provided by energetic (> or = 25 keV) electrons is consistent with the observations, provided the white-light source during the impulsive phase consists of an overdense region located somewhat higher in the chromosphere than the levels where hydrogen densities of about 10 to the 14th power 1cc normally occur. At the maximum of the gradual phase, the white-light emission might, within the limits of the observational uncertainties, be produced by higher energy (or about keV) electrons in a normal chromospheric structure.

535,370
AD-A153 638/2/GAR PC **A02/MF A01**
Sacramento Peak Observatory, Sunspot, NM.
Determination of the Lifetime of Vertical Velocity Patterns in Mesogranulation and Supergranulation,
F. Hill, J. Toomre, L. J. November, and K. B. Gebbie. Sep 84, 16p AFGL-TR-85-0069
Grant NSF-AST78-17292
Pub. in Small-Scale Dynamical Processes in Quiet Stellar Atmospheres, p160-172 Sep 84.

Observational studies of the vertical velocities of mesogranulation and supergranulation provide conflicting results for the lifetimes of these patterns when analyzed by two different methods. Visual inspection of the velocity images suggests that mesogranulation has a lifetime in excess of 2 hours, while cross-correlation methods imply a lifetime of only about 40 min. For supergranulation, the correlation technique yields a lifetime of 2.7 hours, far short of the 24 hours found by many other studies considering network structures of horizontal velocities. These discrepancies may be due to temporal changes in the apparent velocity zero, by different distortions in the images due to large-scale flows, or by evolution in the flows controlled by the magnetic fields. Keywords include: Solar convection; Solar atmosphere; Solar velocity fields.

535,371
AD-A153 737/2/GAR PC **A03/MF A01**
Stanford Univ., CA. Center for Space Science and Astrophysics.
Thermal Stability of Static Coronal Loops. I. Effects of Boundary Conditions,
S. K. Antiochos, E. C. Shoub, C. H. An, and A. G. Emslie. Mar 85, 42p Rept no. CSSA-ASTRO-85-14
Contract N00014-85-K-0111, Grant NGL-05-020-272
Prepared in cooperation with Alabama Univ., Birmingham. Dept. of Physics, Grants NAGW-92 and NGR-05-020-668.

We investigate the linear stability of static coronal-loop models undergoing thermal perturbations. The effect of conditions at the loop base on the stability properties of the models is considered in detail. We consider the question of appropriate boundary conditions at the loop base and conclude that the most physical assumptions are that the temperature and density (or pressure) perturbations vanish there. However, if the base is taken to be sufficiently deep in the chromosphere, either several chromospheric scale heights or several coronal loop lengths in depth, then the effect of the boundary conditions on loop stability becomes negligible so that all physically acceptable condition are equally appropriate. For example, one could as well assume that the velocity vanishes at the base. We calculate the growth rates and eigenmodes of static models in which gravity is neglected and in which the coronal heating is a relatively simple function, either constant per-unit mass or per-unit volume. We find that all such models are unstable with a growth rate of the order of the coronal cooling time. The physical implications of these results for the solar corona and transition region are discussed.

535,372
AD-A153 852/9/GAR PC **A02/MF A01**
Smithsonian Astrophysical Observatory, Cambridge, MA.
High Energy X-Ray Study of the Galactic Center.
Final rept.,
F. K. Knight. Apr 85, 2p
Contract N00014-84-K-0015

In this project I have studied the characteristics of the high-energy X-ray sources within 20 deg of the center of the Milky Way Galaxy. The major aim was to obtain an acceptable fit to data from the UCSD/MIT Hard X-ray and Low Energy Gamma-Ray experiment on HEAO-1. In this manner, I could study the spectra, positions and time-variability of about 25 sources. The major results of this project are the following. (1) Most of the sources have steeply falling spectra as expected. (2) An intense, hard source exists within 0.5 deg of the galactic center, and it has a two-component spectrum can be extrapolated to higher energy at the intensity of the gamma-ray continuum, which implies that this continuum is a composite of a number of sources.

535,373
DE85700515/GAR PC **A02/MF A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Sub-Second Pulsations Simultaneously Observed at Microwaves and Hard X-Rays in a Solar Burst.
T. Takakura, S. S. Degaonkar, N. Nitta, P. Kaufmann, and J. E. R. Costa. Nov 82, 15p INPE-2672
U.S. Sales Only.

Sub-second time structures have been found in the emissions during solar bursts in mm-waves and, independently, in hard X-rays. However, simultaneous observations of such fast time structure in mm radio and X-ray ranges has not been available so far. Accordingly, coordinated observations of solar bursts in November 1981 with a high time resolution of a few milliseconds were planned. The hard X-rays (30-40 KeV were observed with hard X-ray monitor (HXM) aboard the Hinotori Satellite with a time resolution of 7.81 ms and the radio emissions were observed on the ground with 45ft dish at Itapetinga Radio Observatory with a high time resolution (1 ms) and high sensitivities at 22 GHz and 44 GHz, supplemented by a patrol observation at 7 GHz with time resolution of 100 ms. The pulsations repeated with a period of about 300 ms. The physical implication of the good correlation is not clear at this stage, but it may give a clue to the understanding of the high energy phenomena occuring during the solar flares. (Atomindex citation 16:008362)

535,374
PB85-189983/GAR PC **E03/MF E03**
Oxford Univ. (England). Dept. of Theoretical Physics.
Initial Conditions for Inflation,
G. D. Coughlan, and G. G. Ross. 1984, 16p REF-91/84

The concept of cosmological 'inflation' was first proposed to explain several long-standing problems in the standard Big-Bang cosmology. Since then, the concept has evolved into what is now known as the 'new inflationary universe', which provides an attractive and believable extension of the standard cosmological model. However, the implementation of this inflationary picture of the universe has usually assumed a choice of initial conditions, which, although at first sight plausible, is actually too naive. The necessary conditions for inflation are discussed. In order to account for quantum and thermal fluctuations in the 'inflaton' field, phi, one must consider a distribution of initial values for phi. Then the requirement that inflation be natural, leads to a constraint on the form of the potential

V(phi). Examples of three different means of preparing acceptable initial conditions are presented.

535,375
PB85-191013/GAR PC **A05**/MF **A01**
National Center for Atmospheric Research, Boulder, CO.
Solar Coronal White Light, Fe X, Fe XIV and Ca XV Observations during 1984: An Atlas of Synoptic Charts.
Technical note,
D. G. Sime, R. R. Fisher, and R. C. Altrock. Mar 85, 77p NCAR/TN-251+STR
Sponsored by National Science Foundation, Washington, DC.

Synoptic observations of the solar corona in white light and in three emission lines (Ca XV at 5964 A, Fe XIV at 5303 A, and Fe X at 6374 A) were carried out during most of 1984 at the High Altitude Observatory's Mauna Loa Solar Observatory and at Sacramento Peak Observatory. These observations were partly in support of the scientific program of the repaired SMM spacecraft. The observations provide a record of the distribution and brightness of the hotter regions of the corona over the year. The authors present these data in the form of synoptic maps for each rotation during the year for the purpose of providing a context for the investigations which are to take place during the Joint Study of Coronal and Prominence Plasmas organized by Goddard Space Flight Center/NASA. In this way, they propose both to describe the data coverage achieved and summarize the large scale properties of the corona in this late descending phase of the solar cycle.

535,376
PB85-191021/GAR PC **A05**/MF **A01**
National Center for Atmospheric Research, Boulder, CO.
White Light Solar Corona: An Atlas of 1984 K-Coronameter Synoptic Charts, December 1983-January 1985.
Technical note,
R. Fisher, C. Garcia, E. Lundin, P. Seagraves, and D. Sime. Mar 85, 78p NCAR/TN-246+STR
See also PB84-184159. Sponsored by National Science Foundation, Washington, DC.

The synoptic observing project of the High Altitude Observatory's Coronal Dynamics Project began on 5 August 1980. The data obtained by the Mark-III K-coronameter located at the Mauna Loa Solar Observatory, Hawaii, are published yearly in volumes of The White Light Solar Corona: An Atlas of K-coronameter Synoptic Charts. The reader will notice a segment of overlapped data at both the beginning and the end of each volume. This is necessary to provide a complete data set of Carrington rotations covering a specific time period because west limb passage occurs 14 days after east limb passage. This set of synoptic data should be regarded as a preliminary presentation in which no corrections have been made for the day-to-day variations in sky transmission and scattering of polarized light by the earth's atmosphere. While there is some inaccuracy incurred in neglecting these effects, it is still possible to use the data set as a characterization of the white light corona. Data from the east and west limbs are presented separately in the synoptic charts, as transient and evolutionary changes in the white light corona can substantially modify the distribution of coronal material over the 14 days between sequential limb transit.

3C. Celestial Mechanics

535,377
AD-A153 754/7/GAR PC **A03**/MF **A01**
Naval Surface Weapons Center, Dahlgren, VA.
Tenth-Order Expansion Formulae for the Orbital Eccentricity Function K (sub lpq)(e) Obtained Using a Symbolic Algebraic Manipulation System.
Final rept.,
S. C. Matney, and A. D. Parks. Nov 84, 30p Rept no. NSWC/TR-84-355

The development of symbolic algebraic manipulation systems for use on digital computers is a fairly recent technical innovation that has not even begun to be fully exploited. The potential for application of these systems to the nonnumeric resolution of complex problems seems boundless. The purpose of this report is to provide the results obtained from the utilization of one such state of the art system, MACSYMA, to provide high-order expansion formulae for the classical orbital eccentricity function found in celestial mechanics theory. These formulae are generally applicable to low eccentricity orbits, and the relative ease with which they were generated demonstrates MACSYMA's analytical process.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

535,378
AD-A153 510/3/GAR PC **A05**/MF **A01**
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
Auroral Zone Electric Fields from DE-1 and -2 at Magnetic Conjunctions.
Progress rept.,
D. R. Weimer, C. K. Goertz, D. A. Gurnett, N. C. Maynard, and J. L. Burch. 28 Dec 84, 76p Rept no. U. OF IOWA-84-22
Contract N00014-76-C-0016, Grant NAG5-310

Nearly simultaneous measurements of auroral zone electric fields are obtained by the Dynamics Explorer spacecraft at altitudes below 900 km and 4,500 km during magnetic conjunctions. The measured electric fields are usually perpendicular to the magnetic field lines. The north-south meridional electric fields are projected to a common altitude by a mapping function which accounts for the convergence of the magnetic field lines. When plotted as a function of invariant latitude, graphs of the projected electric fields are measured by both DE-1 and DE-2 show that the large-scale electric field is the same at both altitudes, as expected. Superimposed on the large-scale fields, however, are small-scale features with wavelengths less than 100 km which are larger in magnitude at the higher altitude. Fourier transforms of the electric fields show that the magnitudes depend on wavelength. Outside of the auroral zone the electric field spectrums are nearly identical. But within the auroral zone the high and low altitude electric fields have a ratio which increases with the reciprocal of the wavelength. The small-scale electric field variations are associated with field-aligned currents. These currents are measured with both a plasma instrument and magnetometer on DE-1.

535,379
AD-A153 757/0/GAR PC **A03**/MF **A01**
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
Images of the Earth's Aurora and Geocorona from the Dynamics Explorer Mission,
L. A. Frank, J. D. Craven, and R. L. Rairden. Jan 85, 42p Rept no. U. of Iowa 85-2
Contract N00014-76-C-0016

Several results from analyses of auroral and geocoronal images from the Dynamics Explorer Mission are summarized. (1) The motion of the transpolar arc of a theta aurora is found to be correlated with the y-component of the interplanetary magnetic field. The arc motion is in the general direction of the y-component (2) A sequence of global images of a small auroral substorm shows the initial development of intense luminosities in a relatively small spatial region, or 'bright spot'm, in the pre-midnight sector of the auroral oval and a subsequent appearance of an expending area of lesser intensities at lower latitudes and contiguous to the midnight boundary of the bright spot. This evolution of auroral luminosities is interpreted in terms of acceleration of electrons in the boundary layer of the magnetotail plasma sheet to produce the bright spot and subsequent injection into, and eastward drift within, the plasma sheet to form the diffuse area of lesser intensities, (3) A series of images of the Earth's geocorona in scattered solar Ly alpha emissions is used to obtain a best-fit spherical model of atomic hydrogen densities in the Earth's exosphere. A Chamberlain model provides an adequate fit to radial distances of 4.5 sub RE, beyond which an exponential fit is used. The geocoronal tail detected as an asymmetric increase in scattered Ly alpha intensities in the anti-solar direction. (Author)

535,380
AD-A153 807/3/GAR PC **A03**/MF **A01**
Science Applications International Corp., La Jolla, CA.
Satellite Measurements of Atmospheric Aerosols.
Final rept. 1 Dec 83-18 Nov 84,
M. Griggs. 29 Mar 85, 28p Rept no. SAIC-85/1606
Contract N00014-77-C-0489

An error analysis of the two-channel techniques has shown that the AVHRR noise will result in root-mean-square errors of about 0.40 in the size distribution parameter, and about 0.08N in aerosol content, N. These errors are increased due to the effects of undetected clouds in the field of view and variations in the ocean surface reflectance. Based on an analysis of the Barbados and USNS Hayes data, these environmental errors could be of the same magnitude for, and larger for N. However, because of uncertainties in the data set there is uncertainty in these estimates of the environmental errors.

535,381
AD-A153 866/9/GAR PC **A02**/MF **A01**
Rice Univ., Houston, TX. Dept. of Space Physics and Astronomy.
Comparison of Precipitating Electron Energy Flux on March 22, 1979 with an Empirical Model: CDAW 6,
S. L. Simons, P. H. Reiff, R. W. Spiro, D. A. Hardy, and H. W. Kroehl. 1 Mar 85, 9p AFGL-TR-85-0079
Grant NGR-44-006-137
Pub. in Jnl. of Geophysical Research, v90 nA3 p2727-2734, 1 Mar 85. Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Data recorded by Defense Meteorological Satellite Program, TIROS and P-78-1 satellites for the CDAW 6 event on March 22, 1979, have been compared with a statistical model of precipitating electron fluxes. Comparisons have been made on both an orbit-by-orbit basis and on a global basis by sorting and binning the data by AE index, invariant latitude and magnetic local time in a manner similar to which the model was generated. We conclude that the model flux agrees with the data to within a factor of two, although small features and the exact locations of features are not consistently reproduced. In addition, the latitude of highest electron precipitation usually occurs about 3 more poleward in the model than in the data. We attribute this discrepancy to ring current inflation of the storm time magnetosphere (as evidenced by negative Dst's). We suggest that a similar empirical model based on AL instead of AE and including some indicator of the history of the event would provide an even better comparison. Alternatively, in situ data such as electroject location should be used routinely to normalize the latitude of the auroral precipitation.

535,382
AD-A153 918/8/GAR PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Sensitivity of Cosmic Ray Trajectory Calculations to Geomagnetic Field Model Representations,
J. E.Humble, M. A. Shea, and D. F. Smart. 1985, 10p Rept no. AFGL-TR-85-0080
Pub. in Physics of the Earth and Planetary Interiors, v37 p12-19 1985.

Cosmic ray vertical cutoff rigidities at sea level have been calculated, using the trajectory-tracing method, for a number of different epochs. These calculations have been carried out for a world-wide grid of locations, and, in an effort to locate the cosmic ray equator, for a fine grid in the equatorial region. Comparison of the vertical cutoff rigidity values obtained using the International Geomagnetic Reference Field model for 1980.0 with those obtained from previous models shows systematic significant changes in the Atlantic Ocean region and over South America. The differences are greater than those predicted utilizing the older field models with their predicted secular change. The cutoff rigidity values calculated using the new IGRF 1980.0 field model appear to be in better agreement with data from cosmic ray latitude surveys in the Atlantic Ocean region. The changes in the cosmic ray equator are asymmetrical with essentially no changes in the equator position in the Asian and Pacific region,

but with significant changes in the South American, Atlantic Ocean and West African regions. Calculations have also been undertaken for different directions of arrival for a satellite orbiting at 400 kn altitude using predicted 1980 field model and the interim 1980 field model adopted in 1981. Some differences have been found. Keywords include: Cosmic rays, Geomagnetic field, Cutoff rigidities.

535,383
AD-A153 935/2/GAR PC **A02/MF A01**
Boston Coll., Chestnut Hill, MA. Dept. of Physics.
Average Electron Precipitation in the Polar Cusps, Cleft and Cap,
M. S. Gussenhoven, D. A. Hardy, and R. L. Carovillano. 1985, 15p AFGL-TR-85-0078
Contracts F19628-81-K-0032, F19628-82-K-0039
Pub. in Polar Cusp, p85-97 1985. Original Contains color plates: All DTIC and NTIS reproductions will be in black and white.

The morphology of high latitude electron precipitation is determined in the polar cap, the polar cusp, and the polar cleft as a function of magnetic latitude, local time, and activity, Kp. Results show that a polar cusp region highly confined in latitude and local time can be identified by a minimum in the precipitating electron average energy. This region lies very close to local noon, but is not spatially coincident with the maximum in precipitating electron flux which occurs several hours earlier. Surrounding the cusp is a well-defined region of low energy precipitation whose contours of constant integral flux have crescent shapes centered about the flux maxima. This is best seen in cases of low magnetic activity when boundary plasma sheet electron precipitation is not strong. We refer to this region as the cleft. The average energy of the cleft electrons increases steadily as one moves away from the cusp in local time and in latitude. The polar cap appears to have two states: an active state, when the IMF is northward; and a quiet state, characterized by polar rain precipitation and occurring when the oval is active. Two-dimensional maps of integral flux and average energy for polar rain occurrence show that the basic variation in this precipitation is from dayside to nightside. The axis of symmetry for the variation is pre-noon to pre-midnight with the integral flux (average energy) increasing (decreasing) from day to night. These variations in number flux and average energy exhibit a symmetry that is an extension of that seen in the cleft.

535,384
DE85700295/GAR PC **A07/MF A01**
Risoe National Lab., Roskilde (Denmark).
Pulse Radiolysis of Gases. H Atom Yields, OH Reactions, and Kinetics of H sub 2 S Systems.
O. J. Nielsen. Apr 84, 126p RISO-R-480
U.S. Sales Only.

The pulse radiolysis equipment and technique are described and its relevance to atmospheric chemistry is discussed. Pulse radiolysis of a number of different chemical systems have been used to check the validity of the proposed mechanisms: 1) The hydrogen atom yield in the pulse radiolysis of H sub 2 was measured by four independent calibration techniques, using reactions of H with O sub 2 , C1NO, and HI. The H atom yield was compared with O sub 2 yields in pure O sub 2 and in O sub 2 /SF sub 6 mixtures which lead to a value G(H) = 17.6. The rate constants at room temperature of several reactions were determined. 2) OH radical reactions with tetraalkylead at room temperature and with ethane, methane, and a series of C1- and F-substituted methanes at 300-400 K were studied. Arrhenius parameters, A and Esub(a), were determined for several reactions. The lifetime of Pb(CH sub 3) sub 4 and Pb(C sub 2 H sub 5) sub 4 in ambient air is estimated. CF sub 2 C1 sub 2 was found to be a very efficient third body, M, in the reaction OH + OH + M arrow H sub 2 O sub 2 + M. 3) In the H sub 2 S systems the HS extinction coefficient at 3242 AA was determined to 9.5 x 10 exp 2 cm exp -1 mol exp -1 . Four rate constants at room temperature were determined. (Atomindex citation 15:069458)

535,385
DE85700514/GAR PC **A02/MF A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Incoming Solar Radiation Estimates at Terrestrial Surface Using Meteorological Satellite.
N. Arai, and F. C. de Almeida. Nov 82, 10p INPE-2567
In Portuguese.Brazilian Congress of Meteorology, Pelotas, RS (Brazil), 1982.
U.S. Sales Only.

By using the digital images of the visible channel of the GOES-5 meteorological satellite, and a simple radiative transfer model of the earth's atmosphere, the incoming solar radiation reaching ground is estimated. A model incorporating the effects of Rayleigh scattering and water vapor absorption, the latter parameterized using the surface dew point temperature value, is used. Comparisons with pyranometer observations, and parameterization versus radiosonde water vapor absorption calculation are presented. (Atomindex citation 16:008361)

535,386
N85-24506/6/GAR PC **A05/MF A01**
Department of Agriculture, Columbia, MO.
Evaluation of Satellite Derived Estimates of Solar Radiation. Supplement.
G. H. Sullivan, V. French, S. K. Leduc, J. L. Sebaugh, and W. W. Wilson. Dec 84, 97p NAS 1.26:175521, E85-10096, NASA-CR-175521
Contract PROJ. AGRISTARS
Sponsored by NASA, USDA, Dept. of Commerce, Dept. of the Interior, and Agency for International Development. Prepared in cooperation with NOAA, Columbia, MO. and Missouri Univ., Columbia. Erts.

Graphs and statistical tables are provided for each of the 23 stations which were analyzed in an effort to evaluate satellite derived estimates of solar radiation.

535,387
N85-24507/4/GAR PC **A03/MF A01**
Department of Agriculture, Columbia, MO.
Evaluation of Satellite Derived Estimates of Solar Radiation.
G. H. Sullivan, V. French, S. K. Leduc, J. L. Sebaugh, and W. W. Wilson. Dec 84, 50p NAS 1.26:175522, E85-10087, NASA-CR-175522
Contract PROJ. AGRISTARS
See also N85-24506. Sponsored by NASA, USDA, Dept. of Commerce, Dept. of the Interior, and Agency for International Development. Prepared in cooperation with NOAA, Columbia, MO. and Missouri Univ., Columbia. Erts.

The reliability of satellite derived estimates of daily insolation is analyzed for twenty-three ground truth observations in the United States over the period March through September 1983. A selection of graphic and statistical comparisons is generated for each location. Summarized results show the general level of reliability of these estimates.

535,388
PB85-187896/GAR PC **A05/MF A01**
National Oceanic and Atmospheric Administration, Silver Spring, MD. Air Resources Labs.
Lidar Observations of Stratospheric Aerosol Over Mauna Loa Observatory: 1982-1983.
Data rept.,
J. DeLuisi, T. Defoor, K. Coulson, and F. Fernald.
Feb 85, 85p NOAA-DR-ERL-ARL-5
See also PB85-115061.

One hundred and nine lidar profiles obtained during the years 1982-1983, are presented. Backscattering ratios are displayed in graphical form for 1-km intervals. Aerosol backscattering cross section, Rayleigh backscattering cross section, backscattering ratio and integrated optical thickness are tabulated, also for 1-km intervals. Two significant episodes of stratospheric aerosol were detected in 1982. A mystery aerosol cloud was detected on the 28th of January and the immense aerosol cloud from El Chichon was detected on the 9th of April. Some additional analysis of the lidar data is given in this report. A plot of stratospheric aerosol optical thickness above 15 km for 1974-1983, inclusively, is given. These tables should be useful for modeling climatic effects of El Chichon.

535,389
PB85-187920/GAR PC **A04/MF A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Space Environment Lab.
TIROS/NOAA (Television and Infrared Observation Satellite/National Oceanic and Atmospheric Administration) Satellites Space Environment Monitor Archive Tape Documentation,
V. J. Hill, D. S. Evans, and H. H. Sauer. Jan 85, 56p NOAA-TM-ERL-SEL-71

TIROS/NOAA satellite archive tapes containing data obtained with the Medium Energy Proton and Electron Detector (MEPED), High Energy Proton and Alpha Particle Detector (HEPAD), and Total Energy Detector (TED) are described. Descriptions of the data include orbital and housekeeping details and the information needed to decode and understand the data. Specifications of the data channels are supplied, with the timing information needed to convert the data to usable information. Description of the archive tape format gives the information needed to read the tape and unpack the data. Appendices supply the retrieval routines used by the Space Environment Services Center in Boulder.

535,390
PB85-191567/GAR PC **A21/MF A01**
Systems Applications, Inc., San Rafael, CA.
SAI (Systems Applications, Incorporated) Airshed Model Operations Manuals. Volume 1. User's Manual.
Rept. for Aug 76-Sep 79,
J. Ames, T. C. Myers, L. E. Reid, D. C. Whitney, and S. H. Golding. Apr 85, 482p EM78-79R2-VOL-1, EPA/600/8-85/007A
Contract EPA-68-02-2429
See also Volume 2, PB85-191575.

This report presents a general view of the Systems Applications, Inc. (SAI) Airshed Model as well as detailed operating instructions for the user. Included are discussions of all the files needed to run the model, the data preparation programs that produce each file, the input formats and data preparation methods, samples of input and output, and information flow diagrams that illustrate the job stream control on any computer. Chapter II presents a technical summary of the SAI Airshed Model; Chapter III contains an overview of the model as a system of computer programs, outlining the five main functions that must be performed by users and programs together. Chapter IV discusses some of the concepts and terms basic to an understanding of the system, followed in Chapter V by descriptions of the job control notations that will be used throughout this manual. Chapters VI through XI examine in detail the five main functions of the system, providing input and output definitions and examples, and job control diagrams for each program that must be exercised.

535,391
PB85-191575/GAR PC **A11/MF A01**
Systems Applications, Inc., San Rafael, CA.
SAI (Systems Applications, Incorporated) Airshed Model Operations Manuals. Volume 2. Systems Manual.
Rept. for Aug 76-Sep 79,
J. Ames, S. R. Hayes, T. C. Myers, and D. C. Whitney. Apr 85, 248p EM78-79R2-VOL-2, EPA/600/8-85/007B
Contract EPA-68-02-2429
See also Volume 1, PB85-191567.

This report describes the Systems Applications, Inc. (SAI) Airshed Model System from a programmer's point of view. Included are discussions of all subroutines and how they fit together, run-time core allocation techniques, internal methods of segment handling using secondary storage, and detailed definitions of the structure of each file in the system. This manual also includes suggestions for implementing the programs on different computers. The SAI Airshed Model System consists of 17 programs that communicate with each other through 17 data files; both the programs and files are described in detail in this manual. Chapter II presents an overview of the system, briefly describing the programs used to perform each of the five system functions. Chapter III contains guidelines for implementing the programs, and Chapters IV through VIII contain detailed descriptions of the programs by function, including hierarchical subroutine tables and short module descriptions. Chapter IX contains detailed file structure definitions for each file in the system.

535,392
PB85-193027/GAR PC **A03/MF A01**
Systems Applications, Inc., San Rafael, CA.
Technical Considerations in Regional Aerosol Modeling.
C. Seigneur, and H. M. Barnes. 1985, 39p EPA/600/D-85/083
Contract EPA-68-02-4076

This work addresses the theoretical aspects of the behavior of aerosol particles in the atmosphere. In particular, it focuses on mathematical modeling of atmos-

pheric aerosols at the regional scale (3001000 km). The paper discusses the evolution of the model in a stepwise fashion. First is considered the mathematical formulation of the transport mechanisms used. Second is a synopsis of the physical processes that affect aerosol dynamics of the aerosol population. Then, a review of the pertinent chemistry of atmospheric aerosols is given. Various mathematical models of aerosol dynamics and chemistry and the formulation of the complete aerosol model are discussed. Concluding remarks include suggestions for future work such as the treatment of aerosols in clouds and model evaluation with data.

4B. Meteorology

535,393

AD-A153 463/5/GAR PC **A12**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
Automated Weather Observing System (AWOS) Demonstration Program.
Final rept. Sep 83-Jun 84,
P. J. O'Brien, J. D. Barab, F. W. Law, J. D. Talotta, and E. R. Waldmann. Sep 84, 251p DOT/FAA/CT-84/20, DOT/FAA-PM-85/1

An operational demonstration of the Automated Weather Observing System (AWOS) was conducted at 14 airport installations in the contiguous United States and Alaska. The AWOS demonstration units employed were procured from two system manufacturers, WeatherMeasure and Artais, and consisted of commercially available equipment including sensors, processors, and auxiliary hardware. The sensors were used to detect and measure nine atmospheric parameters: cloud height, visibility, wind speed, wind direction, barometric pressure, temperature, dew point, precipitation occurrence, and precipitation amount. These data were then digitized, processed, synthesized into voice messages, and updated each minute. Access to the voice message by pilots in flight was accomplished by very high frequency (VHF) omnidirectional range (VOR) or discrete VHF, and for preflight purposes, by telephone access. This report discusses the analyses and provides results and conclusions derived from AWOS demonstration source data collected during the period September 1983 through June 1984. Source data included pilot questionnaire user response, maintenance personnel failure logs, hourly AWOS observations, and official observations when available. It was concluded that, in general, the performance of the system and all sensors at the 14 field sites was acceptable except for the ceilometer and precipitation sensors.

535,394

AD-A153 512/9/GAR PC **A03**/MF **A01**
Champlain Technology Industries, West Palm Beach, FL.
Evaluating Wind Flow Around Buildings on Heliport Placement.
Final rept. Sep 83-Aug 84,
J. B. McKinley. Nov 84, 45p DOT/FAA/PM-84/25
Contract DTFA01-80-C-10080

This report presents a heliport wind assessment method for evaluating and potentially minimizing the influences of building-induced wind on heliport operations. Descriptions and illustrations of wind flow patterns and characteristics for both isolated and multiple building configurations are provided to assist heliport planners, operators, and helicopter pilots in understanding the problems associated with building-induced winds. Based on geometric flow patterns, general guidelines for ground level and rooftop heliport placement are provided. Additional guidelines for determining the area of wind influence about isolated and multiple building configurations are detailed. Rules for calculating the distance from the sides of buildings for heliport siting is provided, as well as, rules for calculating the area of influence from any wind direction. Lastly, rules are defined for calculating the area of influence of buildings with respect to the prevailing climatic wind conditions. Recommendations are delineated for further data gathering and evaluation to validate and enhance the heliport wind assessment methods. Keywords include: Heliports, Turbulence, and Downstream wakes.

535,395

AD-A153 686/1/GAR PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Diagnostic Verification of the GLAS (Goddard Laboratory for Atmospheric Sciences) General Circulation Model as Applied to a Case of Extratropical Maritime Explosive Cyclogenesis.
Master's thesis,
K. A. Ebersole. Dec 84, 113p

The general circulation model from the Goddard Laboratory for Atmospheric Sciences (GLAS) is verified for a case of explosive extratropical cyclogenesis in the North Pacific. Model runs are initialized with GLAS analyses based on the First GARP Global Experiment (FGGE) Level III-b data. Mass and vorticity budget studies are performed on two separate sets of forecasts. One set (SAT) was initialized with all available FGGE data, while the other (NOSAT) was initialized with all FGGE data except satellite data. Explosive development occurs in conjunction with zonal mid-level flow and strong jet streak interaction. The inclusion of underestimated satellite winds in the SAT initial field weakened the intensity of the jet stream and adversely affected the forecasts. The NOSAT run indicated greater surface convergence, divergence aloft, vertical motion and PVA than the SAT run. The NOSAT prognoses developed and positioned the storm more accurately than the SAT prognoses. Additional keywords: Mathematical models, Tropical cyclones, Mathematical prediction, Meteorological charts, and Theses. (Author)

535,396

AD-A153 777/8/GAR PC **A09**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Numerical Study of the Pacific Polar Low.
Doctoral thesis,
R. M. Hodur. Dec 84, 188p

A numerical study is performed to test the hypothesis that the Pacific polar low forms primarily through baroclinic instability. Polar lows are storms, which can be violent, occurring over the oceans primarily in the winter. Linear growth rates computed for a jet profile typical of conditions during the formation of Pacific polar lows yields a growth rate maximum at 1400 km. Although the horizontal scale of this disturbance agrees with observations of the Pacific polar low, this disturbance is shallower and forms further north relative to the jet than indicated by observations. Nonlinear simulations of the 1400 km disturbance indicate that the effects of convection and surface heat and moisture fluxes due to initially large air-sea temperature differences are needed for proper vertical structure, storm position and intensification. Energy budgets of model output indicate that the wave grows through baroclinic instability and that the diabatic effects enhance the baroclinic conversion within the storm. Additional keywords: Mathematical prediction; Weather forecasting; Numerical methods and procedures; and Theses.

535,397

PB85-183911/GAR PC **A19**/MF **A01**
National Oceanic and Atmospheric Administration, Rockville, MD.
Climate Diagnostics Workshop (9th) Annual Proceedings Held at Oregon State University, Corvallis on October 22-26, 1984.
Mar 85, 447p
See also PB81-222200.

Contents:
The 1983-84 climate;
Climate diagnostics:
Temperature;
ENSO and intraseasonal oscillations;
ENSO and intraseasonal oscillations;
West Coast Atmosphere-Ocean climate variability;
Modeling;
Climate diagnostics:
Monsoons and rainfall;
Prediction and specification;
Special topics;
Data sets.

535,398

PB85-187862/GAR PC **A04**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Environmental Sciences Group.
Mesoscale Convective Systems: A Satellite-Data-Based Climatology,
D. L. Bartels, J. M. Skradski, and R. D. Menard. Dec 84, 65p NOAA-TM-ERL-ESG-8

The occurrence of significant Mesoscale Convective Systems (MCSs) over the central United States during April through July is established on the basis of satellite imagery. Track figures for previously documented 1978-1982 Mesoscale Convective Complexes (MCCs), as well as smaller cloud clusters and convective lines that occurred during 1979-1983, are presented. Other climatological attributes, including diurnal characteristics and average durations, are extracted from a tabular documentation of more than 500 mesosystems. This satellite-data-based climatology of convective weather systems may be used, in conjunction with climatologies of severe thunderstorms, as a research resource to help to improve the authors understanding of central United States convective weather.

535,399

PB85-187888/GAR PC **A03**/MF **A01**
National Weather Service, Salt Lake City, UT. Western Region.
Annual Data and Verification Tabulation Eastern North Pacific Tropical Storms and Hurricanes 1984,
E. B. Gunther, and R. L. Cross. Apr 85, 32p NOAA-TM-NWS-WR-189
See also PB85-109635. Prepared in cooperation with Eastern Pacific Hurricane Center, San Francisco, CA.

This is the sixth report of an annual series covering eastern north Pacific tropical cyclone activity. Tropical cyclone prediction models used by Eastern Pacific Hurricane Center (EPHC) forecasters are included in the report. Verification statistics for the 1984 season are shown in the report. Best track, operational positions, and position errors are also included.

535,400

PB85-187904/GAR PC **A05**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Environmental Sciences Group.
Airborne Investigations of Mesoscale Convective Systems (AIMCS), 1984: Operational Summary and Data Inventory.
Jan 85, 82p NOAA-TM-ERL-ESG-9

The Airborne Investigations of Mesoscale Convective Systems (AIMCS) Program-1984 is summarized; type, amount, and frequency are listed for the data obtained. Highlights and outlook for the future are discussed. Each flight mission and the six subprograms are described in detail.

535,401

PB85-187938/GAR PC **A04**/MF **A01**
National Oceanic and Atmospheric Administration, Seattle, WA. Pacific Marine Environmental Lab.
Current Inventory of Anthropogenic Carbon Dioxide in the North Pacific Subarctic Gyre,
J. D. Cline, R. A. Feely, K. Kelly-Hansen, J. F. Gendron, and D. P. Wisegarver. Mar 85, 52p NOAA-TM-ERL-PMEL-60

The most significant environmental issue of the next century will be systematic changes in the earth's climate due to increases in the atmospheric burden of carbon dioxide. This secular increase is the result of the burning of fossil fuels and massive deforestation currently underway. Since 1958, the atmospheric CO2 concentration has risen from about 315 ppm to about 343 ppm; an average rate of 0.4%/yr. Current wisdom places the preindustrial atmosphere at 270 + or - ppm. The major repositories for anthropogenic CO2 are the oceans and the atmosphere. The distributions of freon-11, as a surogate tracer, have been combined with precise measurements of total carbon dioxide, total alkalinity, oxygen, nutrient and hydrography in order to estimate the amount of excess CO2 in the subarctic waters of the North Pacific gyre. Our calculations indicate thatapproximately 4 x 10 to the 15 power g of excess carbon, or about 2% of the total estimated fossil-fuel-derived carbon input now resides in the mixed layer and thermocline waters of the North Pacific gyre.

535,402

PB85-188050/GAR PC **A02**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Environmental Research Labs.

Program for Regional Observing and Forecasting Services (PROFS). Annual Report for Fiscal Year 1984, 1 October 1983 - 30 September 1984.
Jan 85, 25p

The Program for Regional Observing and Forecasting Services (PROFS) enjoyed its fifth year as a NOAA organization in FY 1984. It had been initiated in FY 1980 as a part of the Environmental Research Laboratories. The mission of the program is to improve short-range operational weather services by the development, testing, and transfer of scientific and technological advances. Since its mission relates to both the research and operational sides of NOAA, PROFS receives guidance from a 'Troika', consisting of the Directors of the National Weather Service (NWS), the National Environmental Satellite, Data, and Information Services (NESDIS), and the Environmental Research Laboratories (ERL). Management suggested two areas of focus: Forecasting research and development: a test program and joint research efforts with other NOAA laboratories; Technology transfer: direct work with operational programs such as the National Weather Service's AWIPS-90 (Advanced Weather Interactive Processing System for the 1990s), NESDIS's VISSR Atmospheric Sounder (VAS), and the NEXRAD (Next Generation Weather Radar) program.

535,403
PB85-189108/GAR PC **A09**/MF **A01**
National Center for Atmospheric Research, Boulder, CO.
Two-Point Closure Study of Covariance Budgets for Turbulent Rayleigh-Benard Convection.
Cooperative thesis,
W. P. Dannevik. 1985, 178p NCAR/CT-85
Sponsored by National Science Foundation, Washington, DC. Prepared in cooperation with Saint Louis Univ., MO. Dept. of Earth and Atmospheric Sciences.

Statistical properties of turbulent Rayleigh-Benard convection in a laterally-periodic domain between free-slip boundaries are investigated. Ensemble-mean dynamics of this system are studied by means of a non-Markovian two-point closure obtained from the Direct Interaction Approximation by application of a two-time perturbation formalism and non-equilibrium fluctuation-dissipation relation. The computations are economized by use of Pade approximation methods to estimate the modal response function and triad relaxation time. Comparisons at the level of second- and third-order moments are made between the closure predictions and averages obtained from Direct Spectral Simulation (DSS) solutions of the full Navier-Stokes-Boussinesq equations. The final-state convective heat flux and volume-integrated kinetic energy and thermal variance are predicted to 0(5%) accuracy with the closure model.

535,404
PB85-189553/GAR PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Solar Radiation Data - Statistical Analysis and Simulation Models.
C. Mustacchi, V. Cena, M. Rocchi, and F. Haghigat.
c1984, 72p EUR-9318-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The activities consisted in collecting meteorological data on magnetic tape for ten European locations (with latitudes ranging from 42 deg. to 56 deg. N), analyzing the multi-year sequences, developing mathematical models to generate synthetic sequences having the same statistical properties of the original data sets, and producing one or more Short Reference Years (SRY's) for each location. The meteorological parameters examined were (for all the locations) global + diffuse radiation on horizontal surface, dry bulb temperature, sunshine duration. For some of the locations additional parameters were available, namely, global, beam and diffuse radiation on surfaces other than horizontal, wet bulb temperature, wind velocity, cloud type, cloud cover. The statistical properties investigated were mean, variance, autocorrelation, crosscorrelation with selected parameters, probability density function. (Copyright (c) ECSC-EEC-EAEC, Brussels, Luxembourg, 1984.)

535,405
PB85-190866/GAR PC **A13**/MF **A01**
National Center for Atmospheric Research, Boulder, CO.
Maintenance of Blocking Anticyclones in a General Circulation Model.
Cooperative thesis,
S. L. Mullen. 1985, 293p NCAR/CT-86
Sponsored by National Science Foundation, Washington, DC.

Blocking anticyclones that appear in perpetual January simulations of a general circulation model are examined. Blocks in three geographical regions are studied: the North Pacific, the North Atlantic and Western North America. Local time-averaged balances of vorticity and heat are evaluated for composite cases of blocking. The following common relationships emerged from these budgets. The time-mean divergence term is, in general, a first order term throughout the troposphere and its pattern over severe orography is closely related to the underlying topography. The horizontal advection of the time-mean temperature field by the mean wind throughout the troposphere is a first order term and is mainly responsible for maintaining the block's thermal perturbations. The mountains appear capable of influencing the shape of the model blocks through the divergence term, but preliminary results indicate that orographic forcing may not be absolutely essential for the blocking process to occur in the model.

535,406
PB85-191815/GAR PC **A03**/MF **A01**
National Environmental Satellite, Data, and Information Service, Washington, DC.
Surface Cyclogenesis as Indicated by Satellite Imagery.
F. J. Smigielski, and G. P. Ellrod. Mar 85, 37p
NOAA/TM/NESDIS-9

Indications of extratropical cyclogenesis which can be observed in infrared, visible or 6.7 micrometers moisture channel satellite imagery are summarized. These include semi-quantitative techniques for estimating the minimum central pressure and the location and strength of maximum surface winds accompanying the low. Satellite analysis of extratropical storm systems is invaluable over oceanic regions where conventional data is limited.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

535,407
AD-A153 446/0/GAR PC **A02**/MF **A01**
British Aerospace Dynamics Group, Bristol (England). Bristol Div.
Some Observations on Relative Approaches to Visual Acquisition Modeling.
I. Overington. 20 Jan 81, 7p Rept no. BT-11241

For Trinational activities it is necessary eventually to agree on form of acquisition modelling to be used for system assessment. Two types of modelling are available, MRTD/Johnson criteria or ORACLE/CYCLOPS. Also two distinctly different types of assessment are necessary - comparison of existing systems and specification of future systems to meet GST's. The report discusses the relative status of the models, and the requirements of models to fulfil the two tasks. It is concluded that a form of MRTD modelling, starting from either an NVL-based or ORACLE-based foundation, is adequate for routine comparison of existing systems. For specification of future systems a much more rigorous approach is necessary, involving search and peripheral vision. Such an approach is indicated to be available through the B.Ae.D. suite of visual performance models.

535,408
AD-A153 511/1/GAR PC **A04**/MF **A01**
Department of Defense, Washington, DC.
Selected University Laboratory Needs in Support of National Security.
29 Apr 85, 67p

The Report of the House Armed Services Committee on the 1984 Department of Defense Authorization Act contained the following request: Many of the university laboratories in which Department of Defense research programs are conducted are obsolete and in need of major modernization or replacement. The committee believes a study should be undertaken on the need to modernize university laboratories in the physical sciences, earth and ocean sciences, atmospheric sciences, engineering, computer sciences and other fields essential to our long-term national security. The survey should (1) document the laboratory needs of universities presently engaged in Department of Defense competitive research programs, (2) assess priorities by academic field, (3) provide estimates of costs to meet these needs, (4) provide specific recommendations appropriate to the Department of Defense and others designed to address the need, (5) state the consequences to our long-term national security. This report is a response to that request. Contents: Rationale; Definitions; Research Disciplines and Thrust Areas; DOD Support for University Laboratories; Previous studies; Selective University Laboratory Modernization.

535,409
AD-A153 626/7/GAR PC **A07**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Overhead Management Guide for Aerospace Procurements.
Master's thesis,
D. D. Dietze, and K. F. Walter. Dec 84, 129p

This thesis focuses on the management emphasis concerning overhead cost control. Senior personnel within the Naval Air Systems Command (NAVAIR) review a multitude of cost information. Due to the nature and complexity of these costs, it is extremely difficult to analyze and interpret cost data and, more specifically, to use these data as a basis for the management of cost control. This study will focus on overhead costs, their impact on total costs, and an analysis of management indicators deemed most useful in controlling overhead costs. Findings of the study included: administrative indicators, variance analysis, base forecasting, comparison of dollar amounts, comparison of ratios and a new tool called Overhead Cost Analysis package.

535,410
AD-A153 729/9/GAR PC **A04**/MF **A01**
ARINC Research Corp., Annapolis, MD.
Analysis of Warranty Cost Methodologies.
Technical rept.,
K. B. Tom, E. E. Ayers, and H. S. Balaban. Jan 85, 74p Rept no. 3243-01-TR-3504
Contract N00600-84-D-4045

Warranty/guarantee provisions have been used in military production contracts for a number of years on a very selective basis. With the passage of Section 794 of the Department of Defense Appropriation Act of 1984, it is expected that the use of such provisions will increase significantly. The Act requires warranties for all fixed-price production weapon system procurements unless DoD approves a waiver and advises the Congressional Armed Services and Appropriations Committees. One of the questions that has repeatedly arisen in the Navy about Section 794 is the potential impact of warranties on the cost of Navy programs. The Naval Material Command Cost Analysis Division (MAT-01F4) has taken the lead in the preparation of warranty cost-estimation procedural guides for Navy programs. The guides are to include effective warranty cost-estimation methodologies for determining if a proposed warranty price is fair and reasonable. In concert with MAT-01F4, the Navy Office of Acquisition Research, Defense Systems Management College, is conducting research and development on warranty cost-estimation methodologies. This report presents the results of a study that investigated, reviewed, and analyzed methodologies for estimating the cost of warranty provisions that meet the intent of Section 794. The study provides a basis for establishing uniform procedures for estimating the direct cost or price of warranties/guarantees for a Navy weapon system procurements.

535,411

AD-A153 730/7/GAR PC **A03**/MF **A01**
Logistics Management Inst., Bethesda, MD.
Producibility Engineering and Planning (PEP): Program Management Guidelines.
Final rept. Nov 83-Dec 84,
F. L. Adler, D. G. Alducin, D. V. Glass, and R. A.Gunkel. Jan 85, 44p Rept no. LMI-RE403
Contract MDA903-81-C-0166

Weapon systems and equipment are not always designed for economical fabrication, assembly, inspection, and testing with available production techniques. As a result, deliveries are often late and costs exceed expectations. Production suffers because producibility is not considered early enough during design and because production planning during development is inadequate. We propose guidelines that will provide managers of weapons system programs with a practical approach to developing, executing and funding individual PEP programs. To get the most out of PEP, we recommend that the program manager focus on producibility at the very start of the program and conduct a PEP program that balances design and producibility and incorporates demonstrations of advanced manufacturing processes. During full-scale development, he should carryout out a PEP program that designs and demonstrates production tooling, facilities, and manufacturing methods. We found that when requirements and funding are sound, such as in the F-16 and Air-Launched Cruise Missile programs, a good PEP program can smooth transition from development to production.

535,412

AD-A153 792/7/GAR PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Using Incentives to Improve Maintainability.
Master's thesis,
L. Farnen. Dec 84, 93p

The objective of this thesis was to determine if contract incentives were appropriate for use in Dept. of Defense contracts for the purpose of motivating defense contractors to improve the maintainability of weapon systems under design. To accomplish the objective it was necessary to review the components of maintainability to determine appropriate targets for the incentives and to study the concepts and issues involved in the use of incentives to motivate contractor performance. The conclusions were based in part of the responses obtained during interviews conducted with Government representatives and engineering, contracting, and corporate and program management personnel from the defense industry. In addition, the incentive program in the case of the F/A-18 aircraft was reviewed and analyzed to determine the reason for its success.

535,413

AD-A153 797/6/GAR PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Management Control of Aviation Fleet Maintenance Funds in a Stock Fund Environment.
Master's thesis,
R. J. Gough. Dec 84, 109p

The purpose of this thesis is to evaluate the existing Aviation Fleet Maintenance (AFM) funds control system utilized by the aviation Type Commanders and to assess impact of the stock funding of aviation depot level repairables (AV-DLRs) on this system. This is accomplished in three phases: (1) a literature search of management control theory, from which a set of management control principles are distilled; (2) employment of a case study approach designed to contrast field study findings to these principles; and (3) submission of findings, conclusions, and recommendations. This study concludes that the existing AFM funds control system lacks the fundamental control principles which are necessary to facilitate efficient funds expenditure in a stock fund environment. It is suggested that the absence of a management control system will result in suboptimal AFM funds expenditure and a reduction in aircraft readiness. The adoption of a comprehensive management control system is proposed.

535,414

AD-A153 812/3/GAR PC **A05**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Industrialized Building System/Two-Step Procurement Pilot Projects: Three Case Studies.
Final rept.,
T. R. Napier, and M. E. Lierman. Jan 85, 84p Rept no. CERL-TR-P-85/05

To reduce the cost and construction time of military facilities, the Office of the Chief of Engineers (OCE) initiated a program to verify the applicability of industrialized building systems in military construction. Three projects from the FY82 Military Construction, Army (MCA) program were selected to model this program, which is a 'design/build' approach called the 'Two-Step Formal Advertising' procurement method. The U.S. Army Construction Engineering Research Laboratory (USA-CREL) was asked to report the results of such a program developed by OCE, To do this, USA-CREL monitored these three projects' development and interviewed personnel involved in each phase of construction through occupancy. Results indicate that the Two-Step Formal Advertising procurement is a valid alternative approach under a variety of applications. The projects are: Fort Drum Battalion Headquarters and Classroom; Fort Benjamin Harrison Physical Fitness Center; Fort Stewart Fire Station.

535,415

AD-A153 875/0/GAR PC **A03**/MF **A01**
Yale Univ., New Haven, CT. School of Organization and Management.
Introduction to Changing Race Relations in Management.
Interim rept.,
C. P. Alderfer. Mar 85, 26p Rept nos. SOM-WP-65, TR-ONR-3
Contract N00014-82-K-0715

This report describes an eight year change project designed to effect the working relationships among black and white managers in a corporation of more than 12,000 employees of whom approximately 2,000 are managers. The undertaking began in 1976 with a systematic diagnosis of race relations in management. In 1980, at the conclusion of the diagnostic phase, the corporation committed itself to a program of change defined by a series of six recommendations for change.

535,416

DE84703312/GAR PC **A10**/MF **A01**
National Physical Research Lab., Pretoria (South Africa).
Annual Report July 1981-June 1982.
Oct 82, 211p CSIR-SR-FIS-290
U.S. Sales Only.

A review is given on the activities of the National Physical Research Laboratory for the period July 1981 - June 1982. Research activities in the field of applied physics include: national measuring standards and metrology, optical sciences and physical acoustics. Research is also done in the earth and atmospheric sciences, including: atmospheric sciences, geochronology, geophysics and natural isotopes. In the fields of materials sciences and materials development and utilization research is being done in: materials characterization; ceramics, glass and phase studies; electrometallurgy; electronic materials; metal physics and physical metallurgy. A list of publications by the staff members is included in the review. (Atomindex citation 15:054067)

535,417

DE85700443/GAR PC **A04**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
International Centre for Theoretical Physics. Scientific Activities in 1983.
Aug 84, 66p IAEA-TECDOC-310
U.S. Sales Only.

The main activities and results of the ICTP during 1983 are reported, according to the following programme components: Physics and energy (Plasma physics; Non-conventional energy; Nuclear physics); Fundamental physics (Elementary particles and fundamental theory); Physics of the living state (Medical physics; Applications of physics to medicine and biology); Physics and technology (Condensed matter physics and related; Atomic, molecular and laser physics; Physics of communications); Mathematics (Applicable mathematics); Physics of the environment and of natural resources (Soil physics; Geophysics); other fields. (Atomindex citation 16:003612)

535,418

DE85780468/GAR PC **A07**/MF **A01**
Atomic Energy Commission, Athens (Greece).
Scientific Activities 1980 Nuclear Research Center "Democritos".
1982, 138p INIS-mf-9096
U.S. Sales Only.

The scientific activities and achievements of the Nuclear Research Center Democritos for the year 1980 are presented in the form of a list of 76 projects giving title, objectives, responsible of each project, developed activities and the pertaining lists of publications. The 16 chapters of this work cover the activities of the main Divisions of the Democritos NRC: Electronics, Biology, Physics, Chemistry, Health Physics, Reactor, Scientific Directorate, Radioisotopes, Environmental Radioactivity, Soil Science, Computer Center, Uranium Exploration, Medical Service, Technological Applications, Radioimmunoassay and Training. (Atomindex citation 15:073360)

535,419

DE85780538/GAR PC **A11**/MF **A01**
Ankara Nuclear Research and Training Center (Turkey).
Progress Report 1983 (for the Ankara Nuclear Research and Training Center, Turkey).
1983, 240p ANAEM-FR-83
In Turkish and English.
U.S. Sales Only.

Presented are the research works carried out in 1983 in Physics, Chemistry, Nuclear Agriculture, Health Physics, Electronics Division and Nuclear Information Group of Ankara Nuclear Research and Training Center. (Atomindex citation 15:062360)

535,420

DE85780626/GAR PC **A08**/MF **A01**
Bhabha Atomic Research Centre, Bombay (India).
Progress Report of Technical Physics Division (Bhabha Atomic Research Centre, Bombay, India): April 1980-March 1982.
R. Chaudhry, and P. Vijendran. 1983, 152p BARC-1196
U.S. Sales Only.

Activities, with an individual summary of each, of the Technical Physics Division (TPD) of the Bhabha Atomic Research Centre (BARC), Bombay are reported for the period April 1980 - March 1982. The major thrust of the TPD's work has been in: (i) design and fabrication of instruments, devices and equipment and (ii) development of techniques in the frontline research and technology areas like vacuum science, surface analysis, cryogenics and crystal growing. The Division also provided custom built electronics equipment, vacuum systems and glass components and devices to the various Divisions of BARC and other units of the DAE. Training and manpower development activities and technology transfer activities are also reported. Lists of seminars, colloquia, publications during the period of the report are given. (Atomindex citation 15:070496)

535,421

DE85780633/GAR PC **A04**/MF **A01**
Risoe National Lab., Roskilde (Danmark).
List of Selected Publications 1982. Risoe National Laboratory.
Dec 83, 54p RISO-M-2413
U.S. Sales Only.

The list comprises a selection of scientific and technical publications of Risoe National Laboratory and its staff during 1982. Journal articles, conference papers, and reports are included. The publications are arranged in the following broad subject categories: Energy Supply and Supporting Technology, Environmental and Safety Research, Materials Research, Biotechnology and Radiation Research, Technical and Administrative Services, General. (Atomindex citation 15:070596)

535,422

DE85780634/GAR PC **A05**/MF **A01**
Atominstitut der Oesterreichischen Univ., Vienna.
Progress Report 1981-1983 (Atominstitut der Oesterreichischen Universitaet, Vienna).
G. Eder, H. Rauch, E. Balcar, K. Buchtela, and W. Schwertfuehrer. Jun 84, 88p INIS-mf-9467
In German and English.
U.S. Sales Only.

This progress report describes the research activities of the Atom-institute of the Austrian Universities of the period 1981-1983. The chapter headings are: (1) Electron- and X-ray physics, thermoluminescence and archeometry. (2) Nuclear physics. (3) Nuclear techniques, electronics and EDP. (4) Neutron- and solid state physics with neutron scattering, low temperature physics, theoretical solid state physics and preparation technique. (5) Radiation chemistry. (6) Radiation protection and dosimetry. Each chapter gives a comprimated overview about the research work done in the described period, illustrated by diagrams and tables, a comprehensive list of publications, each citation provided with an (mostly English) Abstract and a comprehensive list of thesis, which are completed or under preparation in the corresponding working group. Additional chapters give lists of educational work, verbal presentation, cooperations with other institutions and personnel. An annex of photos gives an additional impression of the institute. (Atomindex citation 15:070608)

535,423
DE85780678/GAR PC **A03**/MF **A01**
Oesterreichisches Forschungszentrum Seibersdorf G.m.b.H.
International Structural Comparison of Research Centers. Report 1977-1983.
E. Neck. 1984, 29p INIS-mf-9468
In German and English.
U.S. Sales Only.

On an initiative of the Austrian Research Center Seibersdorf in 1977 working groups were organized by a number of European research centers, most of them nuclear research centers, with the aim to arrive at comparative evaluations of cost accounting systems by way of determining cost key figures. In the years 1977-1983 three symposia and three working conferences were organized with up to 30 participating organizations (nuclear and nonnuclear research centers, authorities and industrial companies). Themes of these meetings were: Key figures and how they are determined. Administration of projects. Valuation of material assets. Information systems in an enterprise. Marketing of R and D results. This progress report gives an overview about the activities of these working groups. The presentations at the meetings are published in separate proceedings. (Atomindex citation 15:070595)

535,424
DE85780679/GAR PC **A06**/MF **A01**
Australian Atomic Energy Commission Research Establishment, Sutherland.
Thirty-First Annual Report 1982-1983 (for the Australian Atomic Energy Commission Research Establishment).
1983, 114p INIS-mf-9437
U.S. Sales Only.

Activities and research at the Australian Atomic Energy Commission are reported. The research program is divided into five fields: nuclear technology, the nuclear fuel cycle, environmental science, applications of radioisotopes and radiation, and nuclear science. Within these five areas details are given of the fusion research program, a small effort on fission, developmental work on the SYNROC concept for the immobilisation of high-level waste, studies related to the environmental effects of uranium mining, work in isotope hydrology, radiopharmaceutical research, investigations into the irradiation of foods and medical products, industrial applications of radioisotopes and radiations, nuclear physics research and neutron scattering studies. (Atomindex citation 15:070608)

535,425
ED-253 218 Not available NTIS
Pacific Telecommunications Council, Honolulu, HI.
PTC'85: Toward a Digital World. Telecommunications for Pacific Development. Proceedings of the Annual Conference of the Pacific Telecommunications Council (7th, Honolulu, HI, January 13-16, 1985).
D. J. Wedemeyer. Jan 85, 444p ISBN-0-8248-1009-0
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

More than 60 papers in this conference proceedings address telecommunications issues in the Pacific region, specifically focusing on the development, use, implementation, and management of new digital communications channels. Following a keynote address on the political and economic realities in the Pacific, entitled 'Progress Report on the Independent Commission for World-Wide Telecommunication Development,' by Achmad Tahir, papers are presented chronologically to reflect the focus of the three primary conference days. Papers from the first day cover the development of digital channels, including the conceptual framework and current digital developments in business, satellites (analog versus digital), fiber optics, and broadcasting. Use of the channels was examined on the second day, including requirements, information services and systems, technical and engineering aspects, local area networks, and integrated services digital networks (ISDN). Papers from the final day look at topics related to channel management and policy formation for a digital world, such as international issues; choosing technology; human resources and training; economic, social, and political aspects; networks; and satellite versus fiber optic cables. Some papers provide references. (LMM).

535,426
PB85-184505/GAR PC **A08**/MF **A01**
Office of Management and Budget, Washington, DC.
Background on Major Spending Reforms and Reductions in the FY86 Budget.
4 Feb 85, 165p

Index:
Major freezes and program reforms;
Major program eliminations;
User fees;
Other program savings.

535,427
PB85-185080/GAR PC **A04**/MF **A01**
Office of Science and Technology Policy, Washington, DC.
Progress Report on Implementing the Recommendations of the White House Science Council's Federal Laboratory Review Panel. Volume 2. Status Reports by Agencies.
Jul 84, 66p
See also PB85-185072.

Report of the White House Science Council Federal Laboratory Review Panel.

535,428
PB85-194728/GAR PC **A06**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Practical Manual for a Simplified Accounting System,
M. Kante, P. Perkins, J. Raleigh, C. Ritzert, and N. Robinson. 1982, 107p AID-PN-AAN-841
Sponsored by Department of Agriculture, Washington, DC.

Reflecting experience gained in field tests in the Sahel, this updated manual presents a basic accounting system for use in the financial management of development projects. The first two sections, respectively, note that the basis of project financial management is defined in project documentation and explain and illustrate three types of accounting books which need to be maintained--a donor receivable account, an encumbrance journal for ongoing transactions, and a cash receipts and disbursements control ledger. The bulk of the manual explains and illustrates 18 different project accounting operations. Appendices treat internal controls, accrual accounting, property records, revolving credit funds, and branch accounting; sample forms are provided.

535,429
PB85-197127/GAR PC **A09**/MF **A01**
Department of Commerce, Washington, DC. Office of Management and Organization.
New Perspectives on Federal Management: An Inventory of Shared Administrative Support.
Final rept.
27 Mar 85, 180p COM/OMO-85/1
See also PB85-197135. Sponsored by President's Council on Management Improvement, Washington, DC.

In an effort to encourage efficiency in the delivery of Federal Administrative Support Services, the President's Council on Management Improvement appointed an inter-agency study team to assess Agencies' existing administrative support delivery practices. In this and two companion volumes, the study team reveals that a number of Agencies have taken steps to share or combine administrative resources. In this volume, the team presents an inventory of organizations which are providing shared administrative support on an inter-agency or intra-agency basis. It is designed to be a 'shopper's guide' to organizations providing shared support in the key areas of personnel, procurement, finance, and administrative or property services. It can stimulate others to think about the advantages of cooperation for the delivery of these services.

535,430
PB85-197135/GAR PC **A18**/MF **A01**
Department of Commerce, Washington, DC. Office of Management and Organization.
New Perspectives on Federal Management: Case Studies of Shared Administrative Support.
11 Apr 85, 423p COM/OMO-85/2
See also PB85-197127. Sponsored by President's Council on Management Improvement, Washington, DC.

The cases are written from the perspective of the detached observer. The purpose of the study is to describe what happened, why, and with what effect. The primary aim of this volume is to help people learn about shared administrative support arrangements. The case studies seek to recreate reality, but they are also meant to be readable, useful, and significant.

5B. Documentation and Information Technology

535,431
AD-A153 524/4/GAR PC **A03**/MF **A01**
Logistics Management Inst., Bethesda, MD.
Improving the Defense Energy Information System (DEIS),
M. J. Konvalinka, and J. E. Lengel. Jan 85, 43p Rept no. LMI-ML405
Contract MDA903-81-C-0166

This report provides recommendations for improvements to the Defense Energy Information System (DEIS), an automated management information system with which DoD monitors its supplies and consumption of energy. DEIS provides information about DoD's bulk petroleum products --inventory, consumption, resupply, and sale -- as well as inventory and consumption of energy for utility services. The recommendations focus on the DEIS operational environment, the need for more energy management reports, and the use of microcomputers with DEIS.

535,432
AD-A153 873/5/GAR PC **A09**/MF **A01**
Defense Technical Information Center, Alexandria, VA.
Proceedings of the Annual DTIC (Defense Technical Information Center) Users Conference Held at Alexandria, Virginia on 24-26 October 1984.
Annual rept.,
M. K. Hanna. 26 Oct 84, 193p

These proceedings consist of transcriptions of presentations made at the annual DTIC Users Conference, 1984. The presentations included status reports from the DTIC Directors, the Defense RDT/E On-Line System (DROLS) User Council, and the DTIC Resource Sharing Advisory Group. Other sessions included: DROLS Communications; a New User Orientation; DROLS Workshops for Dedicated and Dial-Up Terminal Users; other Government Information Resources (GPO, DOE, NLM); DTIC Management Data Bases; panels on DTIC Cataloging and Indexing Policies; Shared Bibliographic Input Network/Local Automation Model for an Integrated Cataloging/Retrieval System; the DoD Gateway for Accessing Diverse Information Resources; the Steps to Acquire a DROLS Terminal; the Manpower and Training Research Information System; and the Small Business Innovation Research Program.

535,433
DE85006108/GAR PC **A02**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.

INEL User Network Exchange. Volume 1-85, Jan./Feb. 1985.
T. L. Williams. Jan 85, 22p EGG-IS-6494(1-85)
Contract AC07-76ID01570

This newsletter, of interest to users of the INEL network, contains items of general interest, equipment modifications, business systems descriptions, and software products notes. (ERA citation 10:012011)

535,434
DE85780601/GAR PC **A05/MF A01**
Instituto Militar de Engenharia, Rio de Janeiro (Brazil).
Profile Updating for Information Systems.
Tese (M.Sc.),
J. F. Abrantes. Feb 83, 88p INIS-BR-167
In Portuguese.
U.S. Sales Only.

Profiles updating methods were analysed. A method suitable to the characteristics of the system used in the research (SDI/CIN/CNEN) that uses as the selection criteria the threshold and weights criterion, was determined. Relevance weighting theory was described and experiments to verify precision were carried out. The improvements obtained were good nevertheless more significant tests are required to attain more reliable results. (Atomindex citation 15:068543)

535,435
ED-252 182 Not available NTIS
Academy of Scientific Research and Technology, Cairo (Egypt).
Database Software Selection for the Egyptian National STI Network,
V. Slamecka. Jun 84, 89p
Contract NEB-0016-C-00-2092-00
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The evaluation and selection of information/data management system software for the Egyptian National Scientific and Technical (STI) Network are described. An overview of the state-of-the-art of database technology elaborates on the differences between information retrieval and database management systems (DBMS). The desirable characteristics of such software for Egypt are identified in regard to national-standard features; end-user orientation; performance; security; modifiability; support; database definition, input and maintenance, and search and processing; search output and processing; and administration. Existing commercial DBMS systems are reviewed, an appropriate strategy for the STI network is suggested, and a description is provided of a recommended software package--the mini/micro version of BRS/SEARCH, a full-text information management program. Included are an eight-page reference list and appendices containing information on the status of IV+V Software, the software evaluation form, and results of telephone interviews with BRS/SEARCH users. (Author/LMM).

535,436
ED-252 207 Not available NTIS
Association of Research Libraries, Washington, DC. Office of Management Studies.
Specialty Positions in ARL Libraries. SPEC Kit 80,
D. L. Jenkins. Jan 82, 152p
Some pages may not reproduce well due to light and broken type.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A Fall 1981 Systems and Procedures Exchange Center (SPEC) survey of Association of Research Libraries (ARL) members found that of 80 respondents, 60 libraries reported 123 specialty positions involving a wide range of activities. The initial document in this kit on specialty positions in ARL libraries provides findings and statistics related to the 123 specialty positions reported in the survey. The kit comprises position descriptions in the following categories and institutions: (1) administrative and general management at Case Western Reserve University, Emory University, University of Illinois-Urbana-Champaign, Massachusetts Institute of Technology (2 positions), Temple University, and Smithsonian Institution (2 positions); (2) automation positions at Dartmouth College, University of Missouri-Columbia, Northwestern University, Pennsylvania State University, and Virginia Polytechnic Institute and State University; (3) budgeting, fiscal, and business manager positions at Brigham Young University, University of California-Riverside, University of Hawaii, University of Houston, New York University, University of Rochester, and University of Western Ontario; (4) development positions at Case Western Reserve University and Emory University; (5) personnel officer positions at Brown University, University of Hawaii-Manoa, University of Houston, University of Notre Dame, Pennsylvania State University, Princeton University, Temple University, and University of Western Ontario; (6) planning and research positions at University of Colorado, Colorado State University, and University of Western Ontario; (7) systems analysis positions at Brigham Young University, University of California-San Diego, Duke University, New York University, University of Notre Dame, University of Pittsburgh, University of Tennessee-Knoxville, York University, and National Library of Canada (3 positions); and (8) other positions including special activities librarian at the Smithsonian Institute, specialist classification at New York Public Library, editorial officer at Harvard University, and head of the Wilson Recordings Collection at University of British Columbia. The kit also includes selected tables which include salary statistics for functional specialists in 1982. The concise summary that introduces the kit discusses factors contributing to libraries' needs for specialists, the role of specialists, and managing the specialist. (THC).

535,437
ED-252 208 Not available NTIS
Association of Research Libraries, Washington, DC. Office of Management Studies.
Online Catalogs in ARL Libraries. SPEC Kit 96,
W. G. Potter. Aug 83, 106p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

To check on the status of online cataloging developments in Association of Research Libraries (ARL) member institutions in 1983, a brief questionnaire was sent to ARL libraries that had indicated or reported some progress toward an online catalog. The sample was not intended to be representative of all ARL libraries, and it did not necessarily involve all members developing online catalogs. Of the 29 ARL libraries surveyed, 20 returned the questionnaire and indicated they had taken some steps toward developing an online catalog. The Systems and Procedures Exchange Center (SPEC) kit on online catalogs in ARL libraries comprises: (1) a chart of the survey results; (2) 'Library Operational Requirements: The Online Public Access Catalog, March 1983' (University of Minnesota); (3) 'An Overview of the Prototype of the TRLN Bibliographic Information System, March 1983' (Triangle Research Library Network); (4) 'The Pennsylvania State University Library Information Access System, February 1983' (Pennsylvania State University); (5) 'Integrating Authority Control in an Online Catalog, February 1983' (Ohio State University); (6) 'An Online Catalog for Dartmouth College Library: The Experiment Continues' (Dartmouth College); and (7) 'The Used and the User: The Online Catalog at Virginia Tech, January 1983' (Virginia Polytechnic Institute). The concise summary that introduces the kit defines an online automated library system for the purposes of this study, breaks the development of an online catalog into four stages, and briefly discusses trends and issues. An evaluation form for this SPEC kit is included. (THC).

535,438
ED-252 209 Not available NTIS
Characteristics of Online Searchers in University Libraries,
K. Salomon, and C. Burgess. 1982, 21p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A nationwide survey of online searchers at 150 college and university libraries was conducted to explore various characteristics of this group. From a sample of 380 searchers representing 85 libraries, 201 surveys (52.9%) were returned, and 198 responses were usable. Variables examined include online training, searcher experience, professional responsibilities, continuing education, and graduate degrees. It was found that searchers trained by library school classes tended to be younger than the rest of the group. It was also discovered that online searchers with a second masters degree did not have significantly different job responsibilities than those without a second masters. A list of references and statistical tables showing responses to selected survey questions are included. (Author/THC).

535,439
ED-252 211 Not available NTIS
Pluralism of Rural: A Survey of Reference Service in Iowa Public Libraries Serving a Population of Less Than 2,500,
S. S. Eckert. Jul 84, 91p
Certificate of Advanced Study Project Report, Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A survey of 200 Iowa rural public libraries serving a population of less than 2,500 was conducted in 1984 to determine reference service characteristics. A total of 137 libraries responded to a survey modeled after a questionnaire developed by Bernard Vavrek for a 1981 nationwide survey. It was found that the number of full-time staff members was less than one-half the number of volunteers, and less than one-fourth the number of part-time staff members. The highest level of training achieved by 50% of all staff members reported was a high school diploma. The data showed that hours of service and annual budget increased proportionately to an increase in population served. Less than half of the libraries reportedly kept records on the total number of questions asked. It was found that a weekly average of 68.96 questions were made up of 64.1% reference questions and 35.9% directional. The subject categories of questions reported as most frequently asked did not correspond to those categories reported as most difficult to answer. Respondents indicated that additional reference materials, additional reference training, and additional hours of service would contribute most to improving reference service. A sample questionnaire, glossary, 32 tables containing cross analyses of data collected, and a 66-item bibliography are provided. (Author/THC).

535,440
ED-252 212 Not available NTIS
Tennessee Univ., Knoxville. Univ. Libraries.
Retrospective Conversion of Music Collection. Project Manual,
P. S. Bayne. Sep 84, 56p
Grant G0008301289
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This manual describes procedures followed by the University of Tennessee, Knoxville Library Cataloging Department in its Music Retrospective Conversion Project. The goal of the project, running from October 1, 1983 to December 31, 1984, is full conversion of bibliographic records for scores, recordings, and music monographs to machine readable format. The manual is divided into two sections. In the first, those procedures that form the general workflow are briefly described, with designations of staff responsible for each step. The second section provides step-by-step instructions for individual phases of the project: searching, questionable match resolution, authority work, coding and input, music analytics, and editing. A 16-item bibliography is provided. Forms used in the project are appended as samples to be freely adopted or modified by other libraries. (THC).

535,441
ED-252 214 Not available NTIS
Alice at One: Candid Reflections on the Adoption, Installation, and Use of the Virginia Tech Library System (VTLS) at Ohio University,
H. Lee. Sep 84, 16p
Paper presented at the National Conference of the Integrated Online Library Systems (2nd, Atlanta, GA, September 13-14, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Designed to help institutions considering library automation, this report describes the adoption, installation, and use of the Virginia Tech Library System (VTLS) at Ohio University. The report includes information on: (1) a task force created at Ohio University in 1978 to explore an automated circulation system; (2) installation and tape loading of the chosen system; (3) inauguration and upgrading of the system; (4) networking, including service to regional libraries and service to public libraries; and (5) difficulties encountered and lessons learned, including estimating equipment needs, estimating other costs, loading archival types,

availability of the system during loading, securing the database, turnover in VTLS personnel, and delays in developing promised subsystems. Appendices include a diagram of OCLC-VTLS complementarity, sample online public access catalog screens and sample circulation screens, a list of equipment and its location on campus, a diagram of the intra-university computing network, and a map of Ohio's proposed microwave interconnect system. (THC).

535,442

ED-252 215 Not available NTIS

Memphis State Univ., TN.

Recommendation to Continue the BRS/After Dark End User Search Service,

S. Mader, and E. H. Park. 24 Aug 84, 26p

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report constitutes a recommendation to the Director of the Memphis State University (MSU) Library that end user searching be made a permanent part of the existing information retrieval service. The recommendation is based in part on the results of a 1984 study sponsored by the university that assessed the attitudes of students and faculty toward the end user system, BRS/After Dark, and the ease with which they could use it. The report is divided into three sections: the first includes background information on the information retrieval services in the MSU libraries, end user search services, MSU libraries and automation, and the university microcomputer policy; the second section, 'Proposed End User Service in the MSU Library,' details information on users, costs, staffing and service hours, equipment, and specifications for two alternatives: a full-scale service or a minimum service; and the final section presents the authors' recommendations. Appendices include a bibliography on end user searching, a BRS/After Dark brochure, an abstract of the end user study, a list of institutions using BRS/After Dark, and budget proposals for both the full-scale service and the minimum service. (THC).

535,443

ED-252 216 Not available NTIS

German Foundation for International Development, Bonn (Germany, F.R.).

European Cooperation in Development Information and Documentation. Report of the International Conference (Berlin, October 9-14, 1983).

Nov 83, 124p DOK-1208-A/a, IT-26-57-83

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This conference, which was attended by librarians and documentalists from 12 European countries (East and West) and, for the first time, some Third World countries, emphasized the role of electronic data processing (EDP) in information and documentation, particularly in terms of one possible means by which to overcome the barriers in international cooperation. The report summarizes the plenary discussions and presents the full text of both lectures and working group reports. Papers presented at the conference were: (1) 'Computers in Information: Dataprocessing and Change of Structures in Small Size Information Bureaux' (R. Schneemann); (2) 'Low Cost Documentation' (M. Klatter); (3) 'The Subject Approach to Information: The Role and Use of Thesauri. An Introduction to Some Basic Concepts' (R. Supper); (4) 'User Education' (O. Norgaard); (5) 'User Analysis' (D. Steinert); and (6) 'International Information Systems (DEVSIS) (Development Science Information System)' (R. T. de Mautort). Annexes to the report include two additional papers--'DEVSIS-Type Systems and Activities' (Catherine Shearer), and 'Information Exchange in a North-South Context: Is There More to Gain through Cooperation than in Trying to Establish New Markets.' (John E. Woolston)--and reports from the working groups on Interlibrary Cooperation, Research Register and Dissemination, Future of EADI (European Association of Development Research and Training Institutes) and I&D (information and documentation), EDP and DEVSIS, Regional Associations, Preparation of Madrid EADI Meeting, Scandinavian Working Group, and 10-Years EADI Documentation Working Group, 1973-1983. (THC).

535,444

ED-252 218 Not available NTIS

German Foundation for International Development, Bonn (Germany, F.R.).

Implementation of Modern Information and Documentation Systems and Services with Special Reference to Information Needs in Eastern Africa. Advanced Postgraduate Training Course (3rd, Great Britain and the Federal Republic of Germany, June 22-August 1, 1980).

1980, 28p DOK-1057-B/a, KF-28-53-80

Some pages have small or faint print.

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The 7-week Advanced Postgraduate Training Course for Information Specialists from Eastern and Southern Africa described in this document was part of a long term training program designed to provide senior librarians, documentalists, and archivists with information on recent developments in methodology and technology in their special field of work. The report includes: (1) course objectives; (2) a program description; (3) a breakdown of participants by country; (4) a description of the staff; (5) a description of social events; (6) an evaluation of the course; and (7) a description of the study tour in Germany which was part of the course. Appendices include outlines of each of the four modules that made up the course--Information Services, Media Technology, Computer Based Library and Information Systems, and Staffing: Formal Structures and Human Aspects; a list of participants; a vote of thanks written by I. M. N. Kigongo-Bukenya, Deputy Director Public Libraries Board, Uganda; and a speech by Justin Kiyimba, Chief Librarian, Ministry of Public Service, Uganda. The course was attended by 19 participants from Botswana (1), Ethiopia (4), Kenya (4), Mauritius (1), Sudan (1), Tanzania (2), Uganda (4), and Zambia (2). (THC).

535,445

ED-252 219 Not available NTIS

Coordinating Centre for Regional Information Training, Nairobi (Kenya).

Report on Information Systems Workshop (Njiro Hill, Arusha, Tanzania, May 19-31, 1980),

F. Inganji. 1980, 182p CRIT-Series-21/80, DSE-DOK-1053-A/a; K-28-76-80

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

With a view to improving information systems and services in Eastern, Central, and Southern Africa, this Information Systems Workshop was organized by the East and Southern African Management Institute (ESAMI) with assistance from the Coordinating Centre for Regional Information Training (CRIT). The specific aims of the workshop were to acquaint the 26 participants with the various concepts of information systems and services; to familiarize the participants with the latest techniques in information technology for collection, storage, retrieval, and dissemination of information; and to assist participants in understanding the organization and administration of information services. The workshop report comprises the following lectures: (I) 'Conceptual Foundations of Information Theory' (Francis Inganji); (2) 'Information Analysis: Indexing and Retrieval' (Augustine Musana); (3) 'Communication of Information' (Francis Inganji); (4) 'Information Analysis: Classification Systems and Thesaurus' (Ulrich Gehrke); (5) 'Case Study--Indexing' (Ulrich Gehrke); (6) 'The Role of Information in Decision Making' (Martin Shio); (7) 'Acquisition and Processing of Documentary and Other Sources of Information' (Augustine Musana); (8) 'Introduction to Information Systems and Services' (Francis Inganji); (9) a sample of a questionnaire on information and documentation facilities; and (10) 'Records Management' (Francis Inganji). A glossary, a bibliography, KWIC Index example, evaluation questionnaire, evaluation comment, and list of participants are appended. (THC).

535,446

ED-252 224 Not available NTIS

Hawaii State Dept. of Education, Honolulu. Office of Library Services.

Public Library Automation Report: 1984,

M. Gotanda. Jul 84, 150p

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Data processing was introduced to public libraries in Hawaii in 1973 with a feasibility study which outlined the candidate areas for automation. Since then, the Office of Library Services has automated the order procedures for one of the largest book processing centers for public libraries in the country; created one of the first COM (computer-output-microfilm) catalogs to be produced; converted the manual catalog to machine readable form including records which go back to the beginning of the public library system; and undertaken the installation of an online circulation system. This paper reviews the major accomplishments and presents plans for the future in each of the following areas: acquisitions, catalog, serials, circulation, Hawaiiana, nonbook materials, management information systems, reference, computer literacy, library for the blind and physically handicapped, and office management. Related flowcharts, implementation schedules, and circulation statistics are included. (THC).

535,447

ED-252 225 Not available NTIS

New York State Library, Albany.

Regents and Library Service.

1984, 65p

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This Spring 1984 issue of The Bookmark comprises articles examining many aspects of the contribution of the University of the State of New York Board of Regents to the growth and development of library programs in the state. The authors and their topics were selected to show the wide range of concerns and interests that the Regents have had in fostering and nurturing the expansion of libraries and library systems to strengthen education in New York State. The issue comprises: (1) 'In Perspective' (E. J. Josey); (2) 'The Role Libraries Can Play in the Development of Individuals' (Kenneth B. Clark); (3) 'The Regents and Libraries in Nineteenth Century New York' (James Corsaro); (4) 'The Regents and the Development of Statewide Library Policy and Program, 1905-1950' (E. J. Josey); (5) 'A Review of the Board of Regents and State Education Department's Reports and Recommendations, 1956-1983' (Miriam Braverman); (6) 'The Emergence of Multitype Library Resource Sharing: The Reference and Research Library Resources Systems and Beyond' (Jane G. Rollins); (7) 'School Libraries in New York State: Their Roots' (Beatrice Griggs); (8) 'The Regents and the Professional Librarian' (Gerald Shields); (9) 'Independent Learners, Libraries, and the Regents' (Barbara Shapiro); (10) 'Access Issues in an Information Age' (Andrew Geddes); (11) 'New York--Where Learning Never Ends: The Library--A Position Paper' (Mildred Lowe); (12) 'The Public Libraries of New York from a National Perspective' (Brooke E. Sheldon); and (13) 'The Regents and Library Aid Legislation in the 1970's and 1980's' (Joseph F. Shubert). (THC).

535,448

ED-252 230 Not available NTIS

Wisconsin State Historical Society, Madison.

Archival Preservation of Machine-Readable Records: The Final Report of the Wisconsin Survey of Machine-Readable Public Records,

M. David. 1981, 54p ISBN-0-87020-212-X

Grant NHPRC-80-6

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Between November 1, 1979, and April 30, 1981, the Wisconsin Survey of Machine-Readable Public Records was carried out to identify the technical, intellectual, and administrative problems associated with a records management and archival program for machine-readable records. The survey identified machine-readable records in several state agencies; evaluated existing records management, disposition, and retention policies governing machine-readable records; and developed a set of recommendations for improving records management and archival control of these materials. This final report summarizes the survey project. In Part One the history of the project and the strategies employed to inventory, appraise, and accession machine-readable records in the state of Wisconsin are described. Part Two describes the findings of the records survey. Part Three contains recommendations for state agency administrators, legislators, and archivists for establishing a machine-readable records program for state archives, dealing with pre-archival control, legislative support, documentation standards, data base management systems design, and administrative expertise. (THC).

535,449
ED-252 231 Not available NTIS
Wisconsin State Historical Society, Madison.
Implementing a Machine-Readable Records Program: The Final Report of the Wisconsin Machine-Readable Records Project,
M. J. Evans. Jun 83, 149p
Grant NHPRC-81-144
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The Wisconsin Machine-Readable Records Project was conducted by the State Historical Society of Wisconsin between August 1981 and July 1983 as a follow-up to the Wisconsin Survey of Machine-Readable Public Records. Both projects assessed the impact of computer technology on record keeping by state government agencies and addressed the implications of contemporary information technology for archival preservation of public records. This final report summarizes the Records Project which was undertaken to address several specific problems identified by the survey. The five-part report contains a narrative history of the activities of the project; a brief description of its accomplishments; a discussion of some of the unanticipated problems and unresolved issues; a summary of the current status of machine-readable records in Wisconsin; and an outline of the objectives for an ongoing, self-sustaining machine-readable records program at the State Historical Society of Wisconsin. Appendices, which make up more than two-thirds of the document, comprise: (1) General Records Schedule for Machine-Readable Processing Files; (2) Revised Scheduling Policy and Sample Records Disposal Authorizations; (3) Procedures Manual for Machine-Readable Records; and (4) Sample User's Guide for a Machine-Readable Records Series. (THC).

535,450
ED-252 233 Not available NTIS
Wisconsin State Historical Society, Madison.
Midwest State Archives Guide Project: Collateral Reports,
M. J. Evans. 1982, 85p
Grant NHPRC-80-8
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document comprises four reports related to the Midwest State Archives Guide Project. The first report, 'Producing In-House Finding Aids and Administrative Reports: An Expanded Data Base Design,' details an expanded SPINDEX database design that could be used to produce a variety of administrative reports. Specific examples are given and an evaluation of the database design is provided. 'Report on Data Entry Alternatives' discusses the various data entry options available to SPINDEX users, including the CPT 4200 with visual memory, magcard typewriters, Wang word processors, and a text editor on the Univac 1100/82. 'Approaches to Archival Indexing, A Discussion Document' includes background on subject access systems, existing systems, the nature of the Midwest State Archives holdings, the state of information retrieval, the needs and resources of archives, and multi-institutional access. The final report, 'Subject Terms Used in the Illinois State Archives and in the Wisconsin State Archives,' contains lists of terms used for subject access in each of the two states and the Wisconsin Subject Authority List; the authority list provides cross references. (THC).

535,451
ED-252 235 Not available NTIS
North Carolina Univ. at Chapel Hill.
Measurement and Evaluation of Reference Service at the Public Documents and Maps Department of the Duke University Library,
R. A. Hebert. Jul 84, 62p
MSLS Thesis.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This study describes two surveys of the users of the Public Documents and Maps Department of the Duke University Library. The information gathered in the course of this inquiry is reported: (1) in a profile of the users of the department's reference service, and (2) in a comparison and analysis of the evaluations of reference encounters by both users and librarians. The results of the first survey, the user profile, reveal that most users of the documents department are Duke University students seeking information in the area of the social sciences. The types of questions most frequently asked are requests for legislative information, a specific title or article, and statistical information. Results of the second survey, which focused on the effectiveness of the department's reference service, indicate that: (1) many users may have an inadequate knowledge of government documents, (2) users tend to express high rates of satisfaction with the outcomes of reference encounters, and (3) users seem to respond favorably to instruction by librarians in the use of the department's reference tools and sources. The questionnaires used for both surveys, notes, and a bibliography are appended. (THC).

535,452
ED-252 237 Not available NTIS
Brown Univ., Providence, RI.
Disaster Planning and Recovery for Archival Materials in Rhode Island,
R. Sautter, and M. Shea. 1984, 34p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This plan was developed to prevent any unnecessary loss of Rhode Island's library resources in the event of a disaster. Representatives from public, academic, and special libraries, town clerks' offices, and historical societies formed the Rhode Island Disaster Information Task Force, which collected materials from a wide range of institutions. These materials served as a starting point for this plan, which, therefore, reflects the needs of a range of record repositories. (The plan deals only with the protection of materials, not with the safety of personnel.) The plan comprises: (1) Suggested Procedures for Disaster Recovery; (2) Suggested Duties of the Disaster Control Team; (3) Supplies Needed for a Disaster Kit; (4) Information Needed for Disaster Planning; (5) Guidelines for Setting Salvage Priorities; (6) Bibliographic and Acquisitions Tools for Salvage Assessment; (7) Setting Up the Salvage Operation; (8) Milk Crate Code Numbering; (9) the Request for Salvage Aid Form; and (10) the Salvage Evaluation Form. Institutions adopting the plan are encouraged to modify the materials to fit their unique situations. (THC).

535,453
ED-252 240 Not available NTIS
Council on Library Resources, Inc., Washington, DC.
Council on Library Resources, Inc. Twenty-Eighth Annual Report/1984.
1984, 61p
For an earlier report, see ED 243 477.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Highlights of the Council on Library Resources' (CLR) 28th year and descriptions of active projects are included in the body of this report. Preliminary materials include lists of members of the council and of the board of directors, council committees and officers, and council staff and consultants, as well as a memorial to Louis Booker Wright, vice chairman to the CLR throughout its first 27 years of existence. A review of the primary areas of activity during 1983-1984 comprises sections on: library resources, preservation, and access; bibliographic services; management; professional education and training; and special programs. Additional materials include lists of program committees, task forces, and project participants; publications resulting from CLR-supported programs and fellowships; grants and contracts active in fiscal 1984; opinion of independent accountants and financial statements; and program guidelines and grant application procedures. (THC).

535,454
ED-252 241 Not available NTIS
Minnesota Univ., Minneapolis.
Evaluation of the Document Delivery Service Provided by University Libraries, Twin Cities Campus, University of Minnesota. Final Report of a Research Project,
G. D'Elia. 1 May 84, 62p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The University Library System at the University of Minnesota, Twin Cities Campus, is a decentralized system of 35 libraries spread over 3 campuses in 2 cities. This study evaluated the performance of two libraries in the system--Walter Library and the Institute of Technology Libraries--that provide document delivery services to assist faculty members in obtaining documents from any library within the system. The evaluation process entailed both analysis of past performance data and a survey of the faculties served by the two delivery services. Past performance data were cumulated and analyzed to determine the volume and the nature of the materials requested and each library's performance in filling these requests. These analyses are presented in the first part of this report. The self-administered questionnaires, which were completed by 52% of the faculty in all of the departments served by both delivery services, was designed to fulfill two objectives: to gather from the nonusers of the services data describing their reasons for nonuse and the nature and extent of their use of the university library system; and to gather from the users data describing their reasons for use, the nature and extent of their use of the library system, and their evaluations of the document delivery service. A detailed discussion of the design of the survey and the results of the data analyses are presented in the second part of the report. Appendices A and B contain copies of correspondence and questionnaires mailed to nonusers and users of the document delivery service. (THC).

535,455
ED-252 242 Not available NTIS
Texas A and M Univ., College Station.
Future Information Services at the Texas A&M University Library: Background and Recommendations (Report of an Ad Hoc Committee),
C. Cook. 17 Dec 84, 53p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The Ad Hoc Committee on Future Information Services explored possible future directions for information services at Texas A&M University Library and developed a plan to guide the library into the next decade in terms of automated access to information. In exploring future directions for automated information services, the committee members researched and wrote papers on the following topics: (1) the user; (2) information; (3) access to information, including means and technology; (4) the role of libraries and librarians in the future; (5) macro and micro organizational considerations for libraries in the future; and (6) fiscal considerations. These papers are appended. The body of the report consists of a series of recommendations that rest on the concept of utilizing technology to enhance levels of service. The overall aim is to have the funds and trained library personnel available to provide both traditional materials and on-line informational access for users at no charge. (THC).

535,456
ED-252 243 Not available NTIS
Increasing Special Library Collection Use in Very Computer Intensive Environments: Automatic Bibliographic Compilation and the Dissemination of Electronic Newsletters,
J. J. Sanchez. Nov 83, 37p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper describes the development and implementation of an automatic bibliographic facility and an electronic newsletter created for a special collection of aerospace and mechanical engineering monographs and articles at the University of Arizona. The project included the development of an online catalog, increasing the depth of bibliographic description, providing the beginnings of a comprehensive citation index for selected subjects, and developing an automatic bibliographic facility and local area electronic newsletter. Appendices, which make up the major part of the report, comprise: (1) the full code listing for the search program, written in FORTRAN 4, which demonstrates the relative simplicity of the facility for developing bibliographies; (2) the help note written to aid the user in implementing a search; and (3) the full text of an electronic newsletter (the IGEL Bibliographer) developed to make all bibliographic searches available within the interested group. The sample newsletter includes short bibliographies on eigenvalues, geometric nonlinearities, and composites. A source code listing of a single descriptor search facility is included as an addendum. (THC).

535,457

ED-253 224 Not available NTIS
Research Libraries Group, Inc., Stanford, CA.
International Conference on Research Library Cooperation (Stanford, California, October 1-3, 1984). Papers 1-13.
Oct 84, 185p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document comprises a program schedule; welcoming remarks by Herman Liebaers (Brussels), entitled 'Towards a European Equivalent of the Council on Library Resources'; and conference papers presented at an international conference on cooperation among research libraries. The following papers presented at the conference are (with two exceptions) included here: (1) 'Cooperation in the PICA Library Network' (Look Costers, The Hague); (2) 'Shared Cataloging Networks in the Federal Republic of Germany: Some Problems of Planning and Realization' (Guenter Gattermann/no formal paper prepared); (3) 'Library Automation in Sweden: Central vs. Local' (Lars-Erik Sanner, Stockholm University Library); (4) 'The Linked Systems Project: Its Implications for Resource Sharing' (Henriette Avram, Library of Congress); (5) 'The Consortium of University Research Libraries: A New Cooperative Venture in the U.K.' (F. W. Ratcliffe, Cambridge University); (6) 'Setting Up a Network of 'Responsibility Libraries' in Sweden' (Kari Marklund, University of Lund); (7) 'Resource Sharing among Research Libraries: How It Ought to Work' (Richard M. Dougherty, University of Michigan); (8) 'North American Efforts at Worldwide Acquisitions since 1945' (Edward G. Holley, University of North Carolina); (9) 'International Cooperation in Preservation' (John Jolliffe, Bodleian Library); (10) 'International Cooperation in Preservation of Library Materials' (William J. Welsh, Library of Congress); (11) 'Research Libraries Group Preservation Activities' (Marcus McCorison/no formal paper prepared); (12) 'The Electronic Library' (Patricia Battin, Columbia University); and (13) 'Co-Operative Networks and Service to the Scholar' (Brenda Moon, Edinburgh University). (THC).

535,458

ED-253 226 Not available NTIS
Stockton State Coll., Pomona, NJ.
Library Skills. A Self-Paced Program in the Use of Stockton State College Library. Workbook, Handbook, and Program,
D. Cohen. 1982, 106p
Mary Ann Trail co-authored the 'Stockton Workbook Program.' Table of Contents page in the Workbook contains light print.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This course in library skills is designed to acquaint college students with the facilities and resources of their college library (Stockton State College, New Jersey). The two-part module--handbook and workbook-- is used in conjunction with specific college courses. Students proceed at their own pace, turning completed assignments in to the Library Office to be corrected. When all questions are answered correctly, a 'Complete' mark is forwarded by the library to the student's instructor. Organized by types of materials, the handbook and corresponding workbook include the following chapters: (1) Library Tour; (2) Finding and Borrowing Books; (3) Card Catalog--Author and Title Approach; (4) Card Catalog--Subject Approach; (5) Library of Congress Subject Headings; (6) Periodical Indexes; (7) Finding Stockton College Library Periodicals; (8) Newspaper Indexes; (9) More Periodical Sources--The Abstracts; (10) Dictionaries; (11) Encyclopedias; (12) Almanacs; (13) Biographies; (14) Atlases; (15) Book Review Indexes; (16) Government Documents; (17) Audiovisuals; (18) The Library Search--How To; and (19) Preparing a Bibliography. The Stockton workbook uses a numerical code for its answer key to provide flexibility in preparing workbook variations on each assignment. An appendix lists locations and call numbers of reference works cited in the handbook. A brief description of the program which includes the answer keys is attached. (THC).

535,459

ED-253 227 Not available NTIS
Virginia State Library, Richmond.
Long-Range Program for Development of Virginia's Libraries, 1984-1988.
1984, 126p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The 1979 Governor's Conference on Library and Information Services analyzed the needs of the library and information community and resulted in 47 resolutions intended to improve library and information services in Virginia. The long-range plan presented in this document sets forth the status of library development in the state, examines the needs of the state's libraries, and suggests possible ways of meeting these needs over the next 5 years. The needs were determined from reports submitted by local librarians to the State Library, by observation and surveys made by State Library staff, and through consultations with librarians and trustees. This report addresses the resolutions within the framework of LSCA (Library Services and Construction Act) and comprises sections on: Needs Assessment; the State Library; Public Libraries; Institutional Library Service; Service to the Visually and Physically Handicapped; Academic Libraries; School Libraries; Special Libraries; Plan for Library Development; Dissemination of LSCA Program Results; Coordination of LSCA with Other Library Programs; Criteria Used in Awarding LSCA Funds; and Evaluation of LSCA Projects. Attachments include the Governor's Conference resolutions; guidelines, requirements, and standards for various types of libraries and evaluation criteria; lists of members of advisory committees and councils; and the basic state plan. (THC).

535,460

ED-253 229 Not available NTIS
Duke Univ., Durham, NC. Perkins Library.
OECD (Organisation for Economic Co-Operation and Development): A Guide to Publications and Data Available in the Libraries of Duke University,
S. Basefsky. Aug 84, 42p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Designed to make Duke University's collection of OECD (Organisation for Economic Co-Operation and Development) publications and data more readily accessible, this guide is divided into the following sections: Introduction to OECD and its Publications; General References about OECD and its Activities; Indexes and Other Sources for Accessing OECD Publications; Types, Titles, and Availability of OECD Publications; Useful Addresses and Telephone Numbers and Free Information on New OECD Publications; and a Title Index. Most of the periodical and annual publications of the OECD are listed in the fourth section. Each entry includes (1) previous title(s) if any; (2) call number; (3) holdings at Duke University; (4) accession number for analytical abstract and microfiche holdings from the Index to International Statistics (IIS); (5) a brief abstract of the publication; and (6) related publications, if any. (THC).

535,461

ED-253 230 Not available NTIS
Council on Library Resources, Inc., Washington, DC.
Name Authority Cooperative/Name Authority File Service.
May 84, 128p
Prepared by the Task Force on a Name Authority File Service as part of the Bibliographic Service Development Program. For related documents, see ED 205 180 and IR 050 994-996.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report reviews the background and rationale for a cooperative authority file building system and describes the services, products, and operation of the new Name Authority Cooperative (NACO). The document defines the relationship between NACO, other Library of Congress (LC) cooperative projects, and the Linked Systems Project (LSP). The document comprises: (1) a brief description of how the NACO service will be operated by LC, including what will be included in the NACO name authority file, how various types of libraries will contribute to the file or use the records, and how LC will manage the project; (2) delineation of the factors that will be considered in selecting libraries to participate in the ongoing maintenance of NACO; (3) a description of the quality review procedures and standards that will be applied to records; (4) a description of what still needs to be done before NACO begins to function, and an outline of the relationship of NACO to LSP. Appendices include: a report from a 1979 meeting that presents the background and rationale for the project; revisions of the 'Requirements Statement for the Name Authority File Service'; results of a survey conducted in 1982 to ascertain the likely use of such a service and the features that would be most useful; and a glossary. (THC).

535,462

ED-253 231 Not available NTIS
Council on Library Resources, Inc., Washington, DC.
Online Catalog Design Issues: A Series of Discussions. Report of a conference sponsored by the Council on Library Resources (Baltimore, Maryland, September 21-23, 1983),
B. Aveney. Jul 84, 250p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Developed from presentations given at a 3-day invitational meeting of 31 leading online catalog designers from both public and private sectors in North America, these papers provide information about online catalogs--their present form, their use, and the questions that need to be considered in their future refinement. All of the papers in this volume have been edited from transcripts or orignal texts. In a few cases, papers have been extensively reworked. The document comprises: (1) 'Data Structures and Resource Consumption' (John R. Schroeder and Jessie J. Herr); (2) 'Search Retrieval Options' (James F. Corey); (3) 'User Feedback in the Design Process' (Charles Hildreth); (4) 'Screen Layouts and Displays' (Joseph R. Matthews); (5) 'Command Languages and Codes' (Michael Monahan); (6) 'Online User Prompts and Aids' (Clay Burrows); (7) 'Linking of Systems' (Ray DeBuse); (8) 'Telecommunications Considerations for Online Catalogs' (Edwin Brownrigg); and (9) 'Summary Questions and Discussion' (Brian Aveney). An agenda of the meeting and a list of participants are appended. (THC).

535,463

ED-253 232 Not available NTIS
Council on Library Resources, Inc., Washington, DC.
Retrospective Conversion. Report of a conference sponsored by the Council on Library Resources (Wayzata, Minnesota, July 16-18, 1984),
D. Gregor. Sep 84, 142p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The 29 participants in this meeting on retrospective conversion included research and public library administrators; representatives from the Library of Congress, the major bibliographic utilities, and the regional networks; librarians with experience in planning retrospective conversion projects; three authors of the 'Issues in Retrospective Conversion (RECON) Report'; and Council on Library Resources (CLR) staff. This report of the meeting opens with a description and summary of the RECON Report and an exploration of its basic assumptions, followed by an outline of the retrospective conversion activities of the bibliographic utilities--WLN (Washington Library Network), RLG (Research Libraries Group), and OCLC (Online Computer Library Center)--and a discussion of RLAC (Research Library Advisory Committee of OCLC) RECON-related activities. Next, the RECON Report is critiqued by Richard De Gennaro and David Bishop and a three-member panel addresses the topic 'What It Would Take to Make Things Happen.' Recommendations for action resulting from four small group discussions are reported, refined by the entire group, and presented as a set of priorities for council action. Summaries of the recommendations and of the Meeting on Retrospective Conversion for Music Materials are included. A meeting agenda and a list of participants are appended. (THC).

535,464

ED-253 233 Not available NTIS
Council on Library Resources, Inc., Washington, DC.

Retrospective Conversion of Music Materials. Report of a conference sponsored by the Council on Library Resources (Wayzatta, Minnesota, July 18-19, 1984),
D. Gregor. Sep 84, 124p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This meeting on the retrospective conversion (RECON) of music materials brought together 21 individuals to plan the integration and coordination of RECON activities within the context of the music library community. Major music societies and professional music groups were represented as were music faculty and composing communities. This document reports the activities of and recommendations resulting from the meeting. Participants were prepared for the discussion by five position papers: (1) 'Names of Persons and Organizations Associated with the Musical Creation' (Richard P. Smiraglia); (2) 'Retrospective Conversion of Subject Headings and Series' (Catherine R. Garland); (3) 'Uniquely Musical Access Points (Coded)' (Arsen Ralph Papakhian); (4) 'What Can Be Accomplished at the Terminal' (Connie Field); and (5) 'Post Input Authority Work for Retrospective Conversion of Bibliographic Items for Music: What Are the Possibilities' (Ed Glazier). Three subgroups were formed to address the issues raised in the position papers and to discuss the organizational questions posed by the desire to coordinate the efforts of AMLG (Associated Music Libraries Group) and REMUS (a committee of the OCLC Music Users Group). Their individual recommendations and a summary of the group recommendations are included. A meeting agenda, a list of participants, a worksheet on standards for retrospective conversion, and a summary of the Retrospective Conversion Meeting are appended. (THC).

535,465
ED-253 234 Not available NTIS
Kuringai Coll. of Advanced Education, Lindfield (Australia).
Sources of Brief Factual Information. Reprinted with Corrections,
J. B. Schmidt, and B. P. Anderson. 1983, 126p ISBN-0-909177-25-2
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Intended for students studying information resources units at Kuring-gai College of Advanced Education, this coursebook examines the nature of information, its generation, and the categories and characteristics of various formats of information resources available. Designed as an introduction to sources of brief factual information, the document contains sections on dictionaries; encyclopedias; handbooks, manuals, and yearbooks; and directories. For each type of resource examined, the characteristics are given and titles are listed as examples, concentrating on Australian resources but also including works of British and American origin. Appropriate evaluation criteria are discussed and effective means of use are described. Student activities involving independent study and work in class, both on individual and group bases, are included. (THC).

535,466
ED-253 236 Not available NTIS
New York State Library, Albany.
Study of Impact of Technological Change in Library Service Facilities: Changes in Use of the Public Catalog at the New York State Library Associated with the Introduction of Online Subject Searching Capability in the Public Catalog. Summary Report,
B. Lipetz, and P. J. Paulson. 15 Oct 84, 34p
Grant CLR-30007-E
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

To study the users and use of the subject searching capability offered by the new online public catalog at the New York State Library (NYSL) a study was begun before the catalog change in mid-1983 and continued for a considerable time after the change. Data were collected during three 1-week periods; one preceded the catalog change and two followed. It was thus possible to detect differences associated with the catalog change, and also to determine whether any of the differences detected were likely to be permanent or transient. The methodology of the study was adapted from earlier use studies of NYSL. As in the earlier studies, library user traffic was measured unobtrusively throughout the study weeks, and frequent short, standardized interviews were conducted with a sample of users. In this research, the method was applied simultaneously to the population of users of the public catalog, by unobtrusively counting and timing users of the online computer terminals and microfiche viewers associated with the public catalog, and by interviewing a sample of catalog users as they were leaving the catalog-access devices. Factors considered for possible impact effects included: the amount and distribution of use of the public catalog; the proportion of subject searches; the duration of catalog searches; their success rate; the use of librarian assistance with catalog searches; user preference for online catalog access versus microfiche catalog access; the motivation of catalog searches; and the affiliations of catalog users. References, the User Exit Interview Guide, and the Catalog User Interview Guide are appended. (THC).

535,467
ED-253 240 Not available NTIS
Iowa State Dept. of Public Instruction, Des Moines.
Weeding the Library Media Center Collections,
B. J. Buckingham. 1984, 27p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

These guidelines for weeding library media collections are addressed to elementary and secondary school library media centers and to community college and vocational school library resource centers in Iowa. The publication includes some philosophy about weeding, and specific guidelines are summarized in bold-faced type for ease of use. The publication is designed to provide guidance for those who want weeding of all formats of materials (not just print materials) to become an integral part of their selection-acquisition-use-discard cycle. A summary of past departmental policy statements and planning procedures dealing with library collection weeding is followed by topical sections on: why, when, and how to weed, subjective and objective weeding criteria, weeding guidance for print and nonprint collections in schools and community colleges, and how to discard. A 20-item list of sources and flow-charts of steps in both the objective and subjective weeding processes are appended. (THC).

535,468
ED-253 241 Not available NTIS
Alaska Univ., Anchorage.
Alaska is a Library. The Alaska Library Network: A Review of Its Components, Status, and Dreams for the Future,
N. Lesh, and B. J. Morse. Jun 84, 182p
Proceedings of the Annual Conference of the Alaska Library Association (Sitka, AK, March 5-7, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Papers presented at the annual conference of the Alaska Library Association (AkLA) focused on the Alaska Library Network with special emphasis on collection development and resource sharing through networking. Papers and reports from the conference, some of which have been updated, are presented in six chapters. The first provides an overview of collection development in Alaska; how-to information and criteria for assessment activities; summaries of discussions of collection development in various types of libraries; the keynote address by Paul Mosher of Stanford University; and a list of people to contact for help. The second chapter includes a discussion of automation and its use in libraries; information on how to prepare for automation; descriptions of the WLN and OCLC automated systems and factors involved in using a stand-alone system; an overview of the experiences of a school district participating in WLN; and information on automated circulation systems being used in the state. The third chapter provides information on microforms and sources for microfiche readers, and descriptions of the basic tools and distribution systems for resource sharing in Alaska. The last three chapters present comments made by the Alaska State Librarian during the conference, a description of the status of the Alaska Library Network and a set of draft recommendations for its growth and development, and summaries of four conference workshops. (THC).

535,469
ED-253 242 Not available NTIS
Western Australian Inst. of Tech., South Bentley.
Assessment of Library Performance. An Australian Perspective of the British Inter-Library Comparison Project.
J. R. Brockman. 1984, 26p ISBN-0-908155-68-9
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Based on material obtained and observations made in 1982, this Australian study focuses on the British Library's inter-library comparison (ILC) project for academic libraries. The report is presented in five sections, the first of which is a brief introduction. The second section deals with the general concept of inter-organization comparison as a management tool, particularly in the field of higher education. The third section describes the Centre for Interfirm Comparison (CIFC), the British Library's contractor for the academic libraries project. The fourth discusses the Centre's approach to ILC and includes a summary of those portions of the CIFC report that appear relevant to the decision on whether or not the technique would be appropriate for introduction to Australia. Finally, the fifth and last section contains an account of observations made during visits to 6 of the 20 participating libraries, together with points arising from meetings with the staff members of the British Library and the CIFC who were primarily responsible for the project. A nine-item reference list and two functional cost analysis tables--one for loans and reservations and the other for acquisitions and cataloging--from the Inter-Library Comparison for Academic Libraries are included. (THC).

535,470
ED-253 244 Not available NTIS
Association of Research Libraries, Washington, DC. Office of Management Studies.
Brown University Public Services Study Report. Final Report. One of a Series of Self-Studies and Research Projects.
Aug 84, 72p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This self-study by the public services staff of Brown University Library provided an opportunity for them to examine past, present, and future operations. The study was conducted by 33 volunteers from the library staff, who were organized into 1 study team and 5 task forces; they worked more than 14 months to develop the recommendations and plans included in this report. Task forces were organized according to the following issues: Facilities/Space, Interdepartmental Relationships, Staff/Organization, Technology, and User Needs/Philosophy of Service/Image. Comprehensive staff and user surveys were a major part of the self-study effort: more than 1,000 users participated in a survey, and more than two-thirds of the library staff completed questionnaires. The 178 recommendations included in this final report are organized functionally, and the study team has indicated time frames for each action. The recommendations fall into the general areas of: (1) Services, Organization of Service Units and Provision of Services; (2) Technology: Network of Scholars' Workstations, Online Catalog, Data Touch, and Electronic Publishing; (3) Communications, Staff, and Training; and (4) Facilities and Space. The final report includes a list of study participants, an introduction, a statement of the goals and objectives, and a description of the methodology. A descriptive listing of the recommendations is followed by an index of actions required. (THC).

535,471
ED-253 245 Not available NTIS
William Paterson Coll. of New Jersey, Wayne. Sarah Byrd Askew Library.
Collection Development Policy. Revised,
M. Casserly. 1984, 41p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This collection development policy serves as a planning tool for William Paterson College library decision-makers by providing information necessary for the allocation of funds for library materials. As a communications tool it provides guidelines for establishing priorities for the selection of library materials and criteria for the withdrawal of materials from the library collection.

The five-part policy consists of: (1) an introduction; (2) a statement of collection development goals which includes primary and secondary goals; (3) a section on materials selection and withdrawal which includes policies for the selection and acquisition of all print and nonprint materials; (4) a section on general policies; and (5) a section on specific format and collection policies with information pertaining to specific types of materials or to materials in specific library collections. Appendices include copies of the American Library Association's 'Freedom to Read Statement,' 'Library Bill of Rights,' and 'Intellectual Freedom Statement,' and the Educational Film Library Association's 'Freedom to View' statement. Specialized terms used in the policies are defined in a glossary. (THC).

535,472
ED-253 246 Not available NTIS
Illinois Univ., Urbana. Graduate School of Library Science.
Complaint Handling in the Library,
W. C. Robinson. Dec 84, 37p UI-GSLS-OP-166
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Arguing that complaints are inevitable and that complaint handling should be an integral part of the library's public service program, this paper identifies and discusses the components of such a program. Concerns discussed are those that should be of general interest to all types of libraries, and the primary focus is on external complaints, i.e., those made by library users or others not employed by the library. The paper comprises the following sections: (1) Introduction; (2) The Problem; (3) Management Commitment; (4) The Policy Statement; (5) The Procedure; (6) Complaint Receipt and Initial Response; (7) Formalization of the Complaint; (8) Receipt of the Written Complaint; (9) Initiation of Fact Finding; (10) The Fact-Finding Report; (11) Patron Response and Appeal; (12) The Problem Patron; (13) Conclusion; (14) Acknowledgements; (15) References; and (16) Vita. (THC).

535,473
ED-253 247 Not available NTIS
Illinois Univ., Urbana. Graduate School of Library Science.
Oral History in Public Libraries. Occasional Papers Number 167.
J. W. Palmer. Dec 84, 36p UI-GSLS-OP-167
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

In order to gather information detailing the extent and effectiveness of oral history projects in public libraries, questionnaires were sent to public libraries in 11 states that listed 'oral history' among their resources in the American Library Directory, and to a small number of other libraries in these states with oral history projects that have been mentioned in the literature. A total of 182 questionnaires were sent; of the 111 libraries that replied, 6 reported no oral history resources. Usable replies were received from 105 libraries. Following an introduction and discussion of the methodology, this report examines projects developed in California, Illinois, Indiana, and New York in each of the following time periods: pre-1970, 1970-76, and post-1976. Successful projects are noted for each of these states. Oral history projects in seven other states--Connecticut, Iowa, Kansas, Florida, Idaho, Alabama, and Georgia--are also described, but in less detail. Finally, comments and advice, conclusions and recommendations, and a bibliography are provided. (THC).

535,474
ED-253 249 Not available NTIS
National Center for Education Statistics, Hyattsville, MD.
Library Statistics of Colleges and Universities, 1982,
R. A. Heintze. Sep 84, 153p NCES-84-218
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report is based on data gathered in a 1982 survey of college and university libraries conducted as part of the Higher Education General Information Survey (HEGIS). The survey had a 91% response rate from a universe of 3,326 colleges and universities. The 1982 data categories cover the following time frames: staff and library hours as of fall 1982; holdings, acquisitions, receipts, expenditures, circulations, and interlibrary loans for the school year ending in June 1982; and transactions for a typical week in spring 1982. The last prior survey of college and university libraries was conducted in fall 1979. Data from the two surveys are compared to show changes over the years. Tabular summaries of the 1981-82 survey are presented in two parts. Tables in part one are stratified, to provide aggregates for the following categories: universities, 4-year institutions with graduate students, 4-year institutions without graduate students, and 2-year institutions. The tables in part two provide aggregates in the new NCES (National Center for Education Statistics) institutional categories: Doctoral; Comprehensive; General Baccalaureate; Two-Year; Specialized; and New. Appendix A describes these categories. (THC).

535,475
ED-253 251 Not available NTIS
ERIC Clearinghouse on Information Resources, Syracuse, NY.
Online Catalogs: Issues and Concerns,
J. Bausser. 1984, 47p IR-67
Contract 400-82-0001
An ERIC Information Analysis Product.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document explores the various issues and concerns related to the development of online systems in libraries and, in particular, online catalogs. Following a preface, foreword, and introduction, chapters are devoted to each of the following topics: (I) providing for special interests including the disabled; (2) authority control; (3) subject access; (4) retrospective conversion; (5) resource sharing; (6) standards; and (7) education. The document is intended to help those who are involved in online catalog design, implementation, and use by making them more aware: (1) of the issues; (2) of the current activity related to them; and (3) of the consequences of that activity on the library profession, on the services provided to library users, and on the profession, on the services provided to library users, and on the library as an institution. A list of acronyms and a subject bibliography are included. (THC).

535,476
ED-253 256 Not available NTIS
ERIC Clearinghouse on Information Resources, Syracuse, NY.
Networking and Microcomputers. ERIC Digest,
J. Klausmeier. Nov 84, 3p 400-82-0001
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Computer networks can fall into three broad categories--local area networks (LAN), microcomputer based messaging systems (this includes computer bulletin board systems), or commercial information systems. Many of the same types of activities take place within the three categories. The major differences are the types of information available and the way in which access to the information is provided. This digest is primarily concerned with microcomputer based messaging systems but it distinguishes this type of network from the other two. The digest comprises sections on: what networking is; local area networks; commercial information systems; microcomputer based systems; user requirements; getting started; services available; trouble shooting; and resources. (THC).

535,477
PB85-187052/GAR PC **A09**/MF **A01**
Bureau of Reclamation, Denver, CO.
Project Skywater, 1983-84 SCPP (Sierra Cooperative Pilot Project) Data Inventory.
Oct 84, 181p
Portions of this document are not fully legible. Color illustrations reproduced in black and white.

This report contains an inventory of all data collected from October 15, 1983, through April 1984, in association with the SCPP (Sierra Cooperative Pilot Project), a weather modification research project in winter orographic cloud seeding. It is subdivided into an introduction plus 12 sections and appendixes A, B, C and D: Forecasting, Radar, Satellite, Aircraft, Rawinsondes, Surface Meteorological Observations, Precipitation Gage Network, Ground-based Microphysical Observations, Radiometer, Cooperative and Operational Seeding Activities, Snow Chemistry Measurements, National Weather Service, Federal Aviation Administration, and National Climatic Center Products, and Sierra PROBE Data Availability, SCPP Operations for 1983-84, University of Wyoming King Air Flight Summary Notes.

535,478
PB85-190718/GAR PC **E07**/MF **E07**
Foras Forbartha Teoranta, Dublin (Ireland).
Abridged Building Classification (ABC) For Architects Builders Civil Engineers,
L. M. Glertz, and N. J. Hughes. Dec 81, 118p ISBN-0-906-120-84-5

The Universal Decimal Classification, UDC, has long been recognized as useful for the international exchange of publications and information because it is independent of language and is widely used in most countries of the world. The copyright of the system is held by the International Federation for Documentation, FID, and amendments to the classification are only made with international agreement. The Abridged Building Classification, ABC, presents a selection of numbers from the Universal Decimal Classification designed for easy and practical application in architecture and building. It can be as readily used in a practitioner's office as in a special library. Simple rules for using it are given.

535,479
PB85-193068/GAR PC **A02**/MF **A01**
Computer Sciences Corp., Gulf Breeze, FL.
EPALIT: A Data Management System Applied to the Control and Retrieval of Technical Reports,
S. M. Means. 1985, 20p EPA/600/D-85/085
Contract EPA-68-01-6639-236

The EPALIT data management system is used by the EPA Environmental Research Laboratory, Gulf Breeze, FL, to preserve and manipulate information in text databases. EPALIT provides the logical resources for data organization, analysis, and retrieval. It is completely interactive and permits natural language searching with full or truncated terms, imbedded word fragments, and Boolean search strings. The library has applied this system to the control and dissemination of its information resources. The Contribution Database, consisting of the laboratory's in-house and extramural publications, is the most sophisticated application to date. EPALIT's features are described in the context of this Contribution Database and its various report formats illustrated.

535,480
PB85-193720 Not available NTIS
Research Triangle Inst., Research Triangle Park, NC.
PADRE (Particle Data Reduction): A Computerized Data Reduction System for Cascade Impactor Measurements.
Journal article Jan 83-Jan 84,
C. E. Tatsch, W. M. Yeager, and G. L. Johnson.
c1984, 8p EPA/600/J-84/292
Contract EPA-68-02-3146
Pub. in JAPCA, v34 n6 p655-660 Jun 84.

The paper describes the Particle Data Reduction (PADRE) system, developed to attract high-quality size-mass distribution data for the Fine Particle Emissions Information System (FPEIS), a component of EPA's Environmental Assessment Data Systems (EADS). FPEIS is the heart of a comprehensive information system for fine particles suspended in gas streams. PADRE users interactively store, edit, reduce, and analyze observed impactor data from anywhere in the Continental U.S., with no computing expenses. Extensive data quality checks and computer-prompted, user-directed program operations are featured to assist users in obtaining meaningful information a few minutes after impactor data are entered. Design goals, program operation, and sample sessions are discussed, as well as plans for future system development.

535,481
PB85-928202/GAR PC **E05**/MF **A01**
Central Intelligence Agency, Washington, DC.
Directory of Chinese Officials: Scientific and Educational Organizations.
Feb 85, 86p CR-85-10229
Supersedes PB82-928216.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB85-928200.

The document is an update of the December 1982 directory listings personnel and organizations con-

cerned with science and education in the People's Republic of China.

535,482

SHR-0012394/GAR PC **A03**/MF **A01**
National Association of State Units on Aging, Washington, DC.
Human Services Information Systems: A Selected Bibliography - 1970 to Present,
F. J. De Jong. Feb 82, 39p
Grant AOA-90-AT-0025

The focus of this bibliography is on the application of information systems in particular operating environments. It includes sources regarding service taxonomies and classification schemes, and some references relating to unit of service measures. Materials utilized include reports, monographs, presentations, papers, journal articles, books and dissertations which are produced by a number of sources, including government agencies, the university and research community, private organizations, businesses and consultants. Topic areas include aging, with 16 sources, child welfare, with 33 resources, mental health, with 37 resources, and social sciences, with 162 resources.

535,483

SHR-0012395/GAR PC **A03**/MF **A01**
National Association of State Units on Aging, Washington, DC.
Accessing Gerontological Information and Literature: An Annotated Directory of Selected Information Vendors, Data Bases and Archives,
F. J. De Jong. Sep 82, 33p
Grant AOA-90-AT-0025

The purpose of this directory is twofold. First, it introduces program-on-aging staff and other human services professionals to the major aging-related computerized data resources. Second, it provides ancillary support to the NASUA Information Systems Training Package. The directory presents sources of data base access and vendor services (4), bibliographic or reference data bases (31), and data archives (10). Three appendices are included.

5C. Economics

535,484

AD-A153 525/1/GAR PC **A03**/MF **A01**
Logistics Management Inst., Bethesda, MD.
Test of Proposed Changes in the Impact Aid Program,
I. M. Greenberg, E. D. Simms, and D. L. Goodwin.
Feb 85, 50p Rept no. LMI-ML430
Contract MDA903-81-C-0166

School Assistance for Federally Affected Areas (Impact Aid) helps compensate local school districts for the expense of educating federally connected children, An April 1984 LMI report 'Proposal to Revise the Federal Impact Aid Program ' (Task ML326) proposed changes that address: (1) the types of children eligible for Impact Aid; (2) the method used to compute the Local Contribution Rate; (3) the entitlement weight by type of child; and (4) the allocation method used to adjust to different levels of program funding. We tested the proposed changes by comparing payments that were made to school districts in FY 82 with payments that would have been made under the revised methods. Results show that the changes would achieve their objectives: 68% of the military dependents are in school districts that would have received higher payments. Thirty-two percent are in districts that would have received lower payments or none at all. In most of these losing districts, military dependents represented less than five percent of total enrollment. High-impact districts would be favored on a sliding scale when program funds are reduced, The payment system will be simplified. Mustering support fort these changes will be difficult because more school districts will lose funds than will gain and many districts will receive nothing at all. It is feasible to adopt parts of the package of changes rather than the whole package.

535,485

AD-A153 660/6/GAR PC **A09**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Capital Investment Motivational Techniques Used by Prime Contractors on Subcontractors.
Master's thesis,
K. S. Holtsclaw. Dec 84, 177p

The current Acquisition Improvement Program (AIP) has focused a great deal of attention on many of the perceived management problems in the federal acquisition process. Included among these are the motivation of contractors to make productivity enhancing capital investments. Although this problem has been addressed previously by profit policy, the effect has been minimal. Most efforts have been directed at the prime contractor level with little effect to date. This thesis examines the complex array of factors which result in productivity enhancing capital investment and raised the question of what has been accomplished at the subcontractor level. The research, through the use of a subcontractor survey, determined that little if any effort was expended at the prime contractor level to motivate subcontractor to invest in productivity enhancing capital equipment. Until recently, subcontractors have been excluded from DOD efforts to incentivize capital investment.

535,486

AD-A153 705/9/GAR PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Cash Management in the United States Marine Corps.
Master's thesis,
J. W. Farmer. Dec 84, 90p

For most of the history of this country, cash management within the Federal government consisted primarily of accounting for receipts and expenditures. The result was a myriad of directives and circulars requiring agencies to tighten the control and expedite the processing of Federal receipts and expenditures. The purpose of this thesis is twofold. First, it is to provide a general overview of current Department of the Treasury requirements and the current status of Marine Corps efforts in implementing policy to satisfy those requirements. And second, it will bring under one cover, the historical background, directive literary references, current requirements, and current Marine Corps policy for use as an all-encompassing reference for future Marine Corps graduates in Financial Management.

535,487

ED-253 215 Not available NTIS
Open Univ., Milton Keynes (England). Inst. of Educational Technology.
New Communications Technology and Distance Education: Implications for Commonwealth Countries of the South. Papers on Information Technology No. 239,
A. W. Bates. Dec 84, 24p
Paper prepared for Commonwealth Secretariat. Light type may not reproduce well.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This review of the technical possibilities of audio, television, computing, and combination media addresses the main factors influencing decisions about each technology's suitability for distance teaching, including access, costs, symbolic representation, student control, teacher control, existing structures, learning skills to be developed, and feedback. Specific technologies are considered by type as follows: (1) audio: radio, audiocassettes, telephone teaching; (2) television-based: broadcast, cable, and satellite television, videocassettes, and videodiscs; (3) computer-based: hardware developments and some of the functions of microcomputers, computer assisted learning (CAL), computer conferencing, and audiographics systems; and (4) combination systems: computer and videodisc technologies and viewdata, which combines telephone, computer, and television technologies. Questions are raised concerning the potential social and educational effects of introducing these newer technologies to distance education; their cost-effectiveness; their potential impact on the nature of distance education; and whether they should be used in poorer developing countries. Four references are listed. (LMM).

535,488

NUREG-1131/GAR PC **A02**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of State Programs.
Financial Analysis of Potential Retrospective Premium Assessments Under the Price-Anderson System,
R. S. Wood. Apr 85, 21p

Ten representative nuclear utilities have been analyzed over the period 1981-1983 to evaluate the effects of three levels of retrospective premiums on various financial indicators. This analysis continues and expands on earlier analyses prepared as background for deliberations by the U.S. Congress for possible extension or modification of the Price-Anderson Act.

535,489

PB85-185999/GAR PC **A04**/MF **A01**
Fish and Wildlife Service, Fort Collins, CO. Western Energy and Land Use Team.
Summary of the Report and Recommendations on Funding Sources to Implement the Fish and Wildlife Conservation Act of 1980,
R. W. Olson, J. B. Loomis, R. L. Johnson, C. A. Segelquist, and S. R. Amend. Dec 84, 67p
BIOLOGICAL-85-(4)
Errata sheet inserted.

This document summarizes a more detailed report on a study, plus associated recommendations provided to the U.S. Congress by the U.S. Fish and Wildlife Service, as required by Section 12 of the 1980 Fish and Wildlife Conservation Act, Public Law 96-366. The detailed report is entitled, 'Potential Funding Sources to Implement the Fish and Wildlife Conservation Act of 1980,' U.S. Fish Wildl. Serv. Biol. Rep. 85(5). The purpose of this study was to develop information and data for determining, in consultation with potentially affected parties, the most equitable and effective mechanism for funding grants to States for nongame programs. Congress specified that this study include, but not be limited to, funding by potential excise taxes on appropriate items.

535,490

PB85-187227/GAR PC **A08**/MF **A01**
Agency for International Development, Washington, DC. Office of Evaluation.
Impact of PL 480 Title 1 in Peru: Food Aid as an Effective Development Resource.
Project impact evaluation rept. no. 47,
T. Johnson, and E. B. Berry. Oct 83, 166p AID-PN-AAL-021

Peru's experience with P.L. 480 Title I food aid provides some important lessons, especially regarding USAID/P's success in integrating Title I into overall A.I.D. assistance. The Title I program's in-country context, key elements, and impacts in Peru, 1978-83, are herein reviewed. While it is difficult to isolate Title I impacts on agricultural production or nutritional status, several results of long-term importance can be noted. USAID/P's use of Title I--generated local currency to provide counterpart funding has kept USAID/P development projects fully funded in times of economic crisis, allowed the Mission to respond quickly to new initiatives and special projects, leveraged additional Government of Peru (GOP) resources into successful projects.

535,491

PB85-188167/GAR PC **A03**/MF **A01**
Foreign Agricultural Service, Washington, DC.
Export Markets for U.S. Grain and Products, March 1985.
Foreign agriculture circular.
Mar 85, 33p EMG-3-85
See also PB85-176675.

During the recent slackening of growth of world grain trade volume, the strength of the U.S. dollar has often been cited as a major contributing factor. Since most international grain transactions are U.S. dollar-denominated, it is true that the cost of grain to users in importing countries has increased very sharply in nominal terms, e.g., pesos per ton, tec. However, there has been some tendency to exaggerate this development, thus giving the currency factor disproportionately large importance relative to other causes of the slow-down of grain importation and usage in foreign countries. Sharp changes in exchange rates vis-a-vis the U.S. dollar have generally been accompanied by unusually high or run-away inflation rates which largely offset and in some cases exceed the change in exchange rate. As a result, the real cost of grain to users in importing countries has risen much less sharply than is indicated simply by the change in exchange rates.

535,492
PB85-188803/GAR CP **T99**
Federal Reserve System, Washington, DC.
Report of Condition and Income for Commercial Banks and Selected Other Financial Institutions, June 30, 1974. Call and Income Report. Data file,
J. McDaniel, R. Chamberlin, and J. Benkovic. 30 Jun 74, mag tape FRS/DF-85/002
Source tape is in the EBCDIC character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products for price.

The Federal Bank supervisory agencies require banks and related corporations to report on their financial posture on a quarterly basis. Call Reports are required from FDIC insured commercial banks, banking edge and agreement corporations, branches and agencies of foreign banks (IBA's), and New York State Investment Companies (NYIC). FDIC insured commercial and savings banks are required to file Income Reports. International Banking Facility (IBF) Reports are filed by IBA's. All of these reports are filed quarterly except for FDIC 8040/51, which is semi-annual. Reports filed and their contents are summarized below: Consolidated Report of Condition and Income for a Commercial Bank: FFIEC 031: with Domestic and Foreign Offices; FFIEC 032: with Domestic Offices Only and Total Assets of $300 Million or More; FFIEC 033: with Domestic Offices Only and Total Assets of $100 Million or more but less than $300 Million; FFIEC 034: with Domestic Offices Only and Total Assets of less than $100 Million; FDIC 8040/18: Consolidated Report of Condition for a Savings Bank; FDIC 8040/51: Consolidated Report of Income for a Savings Bank. These reports consist of a balance sheet, income statement, and supporting schedules. The Report of Condition schedules provide details on assets, liabilities, and equity capital accounts.

535,493
PB85-188910/GAR PC **A02/MF A01**
Environmental Protection Agency, Research Triangle Park, NC. Air and Energy Engineering Research Lab.
Engineering Application and Economics of LIMB (Limestone Injection/Multistage Burners),
N. Kaplan, D. G. Lachapelle, and J. Chappell. 1985, 19p EPA/600/D-85/071

The paper describes the use of an EPA LIMB cost model, in conjunction with cost and performance models for flue gas desulfurization (FGD), to compare these two technologies under similar premises. (NOTE: The performance goals of LIMB, EPA's acronym for Limestone Injection/Multistage Burners for use in SO2/NOx control for coal-fired boilers, are 50-60% reduction of SO2 and NOx for retrofit systems, and achievement of New Source Performance Standards (NSPS) for SO2 and NOx for application on new utility boilers. These performance requirements, furthermore, are to be achieved at significantly lower cost than that for FGD, the major control technology alternative.) For a new 500 MW unit burning 1.92% S coal and achieving control to meet NSPS, costs per ton of SO2 removed are estimated to be $1377, $771, and $921 for limestone FGD, lime spray drying, and LIMB using calcitic hydrate, respectively. At 0.48% S in the coal, these costs are estimated at $3715, $1954, and $1134 for limestone FGD, lime spray drying, and LIMB, respectively. For a 300 MW retrofit system, costs per ton of SO2 removed for wet limestone FGD and LIMB using calcitic hydrate on a 1.92% S coal application are $1359 and $844, respectively.

535,494
PB85-191047/GAR PC **A02/MF A01**
American Embassy, Seoul (Republic of Korea).
Korean Fishing Industry, 1983.
Final rept.,
R. C. Devine. 16 Mar 85, 7p NMFS-FM321/85-11

The overall economic trend in 1983 indicated that the Korean fishing industry--which is the world's ninth largest--was an industry in slow decline. In real terms fisheries accounted for 1.5 percent of Korea's Gross National Product in 1982; this percentage dropped to 1.3 percent in 1983. Furthermore, the value added component of the fisheries sector to the GNP decreased by 4.4 percent in real terms from 1982 to 1983. In nominal terms, however, this component increased 27.4 percent from 1982 to 1983 because of increased fish prices.

535,495
PB85-191351/GAR PC **A04/MF A01**
Michigan State Univ., East Lansing.
Market for Livestock and Meat in Saudi Arabia: Implications for Somalia,
J. S. Holtzman. Jun 82, 63p AID-PN-AAN-488

Trends in Saudi Arabia's importation of livestock and meat and the resulting implications for Somalia and other countries in the region are assessed. Discussion is given in turn to: (1) trends in the composition of live animal and chilled/frozen meat imports to Saudi Arabia and the estimated consumption of red and white meat; (2) livestock prices and consumer preferences for different types of meat; (3) the structure of Saudi Arabia's livestock trade with Near Eastern/East African suppliers and Australia; and (4) the projected demand and supply of meat in Saudi Arabia, with reference to earlier projections.

535,496
PB85-192086/GAR PC **A04/MF A01**
International Crops Research Inst. for the Semi-Arid Tropics, Patancheru (India).
Marketing Efficiency for Selected Crops in Semi-Arid Tropical India,
V. T. Raju, and M. K. von Oppen. Jan 82, 55p
ECONOMICS PROGRAM PR-32, AID-PN-AAL-386

An efficient farm marketing system is an important means of raising farmers' incomes and promoting general economic development. The study reported here analyzes marketing efficiency during 1974-75 in three different regions in India for sorghum, pearl millet, pigeonpea, chickpea, and groundnuts. Two measures of market efficiency are compared: operational efficiency, measured in terms of market costs and marketing margins; and pricing efficiency, measured in terms of correlations among price changes for the same product in separate markets.

5D. History, Law, and Political Science

535,497
AD-A153 506/1/GAR PC **A06/MF A01**
Defense Nuclear Agency, Washington, DC.
Proceedings of the Annual Symposium on the Role of Behavioral Science in Physical Security (10th) - Outthinking the Terrorist: An International Challenge Held at Springfield, Virginia on 23-24 April 1985,
B. G. Curtis. 24 Apr 85, 110p

Contents: The Problem of Terrorism in Contemporary Societies; Legacy of the Age of Andropov; 'Religionization' of Conflict; Incentives for Terrorism; Hostilite, Conformite, Fraternite: The Group Dynamics of Terrorist Behavior; The Psychological Impact of Communication on the Hostage and Family: A Hostage Experience in Colombia; The London Perspective on International Terrorism; Reflections on International Terrorism as Seen From the Middle East; Repentant Terrorist Legislation: A Preliminary Analysis of Problems and Results in Italy; Provisional IRA-A Study in Contradictions; Terrorism and Counterterrorism in the Federal Republic of Germany; Organizing to Meet the Threat; U.S. Perspectives on Terrorism; Multinational Corporations' Response to International Terrorism; Terrorism: The Law As An Effective Deterrent; and Voices from Troy: What Are We Hearing.

535,498
AD-A153 578/0/GAR PC **A04/MF A01**
Joint Chiefs of Staff, Washington, DC. Special Operations Div.
Soviet News and Propaganda Analysis Based on RED STAR (The Official Newspaper of the Soviet Defense Establishment for the Period), 1-31 January 1985. Volume 5, Number 1.
31 Jan 85, 56p
See also Volume 4, Number 5, AD-A145 195.

For more than five years, Soviet propagandists, media commentators, and high-ranking Soviet officials have been consistent and uncomprising in their tough and demanding rhetoric about the dangerous, warmongering and anti-Soviet policies of the United States government. For over five years, the United States has received an average of 60% of the total negative and/or abusive rhetoric in Red Star devoted to foreign governments. During January 1985, the editors of Krasnaya Zvezda (Red Star), the official publication of the Soviet Ministry of Defense, allocated over 44% of international and foreign affairs space (in Red Star) to topics and events that concerned the United States. The primary purpose of this edition is to provide the reader with an overview of Russian rhetoric, propaganda themes, slogans and topics which have been directed to the military forces of the U.S.S.R. during January 1985. It first examines Soviet perceptions and reporting of international events and then considers Red Star's coverage of Soviet domestic and military topics.

535,499
AD-A153 645/7/GAR PC **A03/MF A01**
North Atlantic Assembly, Brussels (Belgium).
Sub-Committee on Advanced Technology and Technology Transfer.
Interim rept.
Nov 84, 34p

This is the first report of the North Atlantic Assembly's Sub-Committee on Advanced Technology and Technology Transfer. The report begins with a description of the Sub-Committee's areas of interest, viz. technology transfer, high technology research, and high technology and economic growth. This report concentrates on technology transfer, describing the flow of Western technology to the Eastern bloc and how this assists the Soviet Union and its allies. The report then examines the differing views on East-West technology transfer and what effect this has on the transfer of technology between Alliance nations. Next, there is a description of the relative technological performance of the United States and the Allies. Finally, the report draws together many of the themes raised in order to formulate some specific policy proposals intended to help resolve disagreements on technology transfer. These proposals would involve reorganizing the way in which Alliance nations license high technology exports, and the creation of an Alliance technology agency both to streamline the Alliance's exploitation of technology and to harmonize exportation policies.

535,500
AD-A153 700/0/GAR PC **A13/MF A01**
Naval Postgraduate School, Monterey, CA.
Party Politics and Greek Security Policy from 1974 to 1984: Change and Continuity.
Master's thesis,
J. L. Haines. Dec 84, 276p

This thesis explores the effects of political change on Greek security policy during the period 1974 to 1984. This period encompases significant change in Greece's foreign relations including those with the United States. The central question is: Are the elements of Greek security policy based on long-term basic interests which find consistent expression, or are they a function of domestic political factors, more ideologically motivated and therefore variable according to the governing political party. The fundamental issues include: relations with the Eastern Bloc, Cyprus, the Aegean Sea, relations with NATO, and U.S. military installations in Greece. These issues are analyzed for three periods: the 1974-1981 New Democracy Governments, the 1974-1981 opposition policies of PASOK, and the 1974-present PASOK government. Although some expected a radical departure in policies with the 1981 change to a socialist government, practical policies have shown very little change. The basic requirements of a developing and maturing country influenced by the conditions of its regional environments and general world conditions seem to lend consistency and rationality to Greek security policy and should be considered in forming Western policy for the region.

535,501
AD-A153 702/6/GAR PC **A04/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Planning and Management Div.
Sea Is Red: The Sino-Soviet Rivalry and Its Naval Dimension.
Professional paper,
K. G. Weiss. May 84, 54p Rept no. CNA-PP-421
Contract N00014-83-C-0725

Despite recent efforts to improve relations, Moscow and Beijing's competition in Asia has continued with little let-up since their proxy war in Indochina (1978-1979). As a result, China continues to look to the U.S. for support against the Soviet Union. This stability in

U.S., Chinese, and Soviet relations can be explained, in part, by looking at the maritime element of the strategic equation in Far East. How do we account for the relative lack of change in relations among the U.S., China, and the Soviet Union--despite significant leadership changes in all three countries since 1979. The reason is simple: strategic realities, as the Chinese like to put it, make a dramatic transformation in the triangular equation difficult, if not necessarily inconceivable. And as in the past, recent Sino-Soviet negotiations have been accompanied by a competition for political and military advantage in Asia. This rivalry has spread to the seas bordering China. It is from this maritime perspective that this paper will view current dynamics in the Sino-Soviet conflict.

535,502
AD-A153 772/9/GAR PC **A02/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Studies Group.
Structure of Anarchy or Thinking About the Global Effects of Extreme Tension in Southwest Asia.
Professional paper,
K. G. Weiss. Apr 80, 21p Rept no. CNA-PP-419
Contract N00014-83-C-0725

The future is clouded with possibilities. What is clear though is that events in Southwest Asia have highlighted the fragility of the world's peace and prosperity. The revolution in Iran has produced the conditions for economic and political problems throughout the world. Soviet involvement in Afghanistan has given further evidence that Moscow will take an activitist course in the pursuit of its goals. Even hampered by their military commitment to Afghanistan, the Soviets will have numerous opportunities to exploit global instability. Economic difficulties will hamper the ability of the U.S. and the West in general to employ their superior economic resources to promote stability in vital regions. Thus, the U.S. may find itself forced to resort to military, including naval, instruments to protect its vital interests.

535,503
AD-A153 801/6/GAR PC **A06/MF A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
Potentially Destabilizing Effects of Islamic Fundamentalism on U.S. Aid to Jordan,
Master's thesis,
C. L. Strobbe. Mar 84, 109p Rept no. AFIT/GAL/LSY/84M-1

The 1979 Islamic fundamentalist revolution in Iran resulted in the replacement of the pro-U.S. monarchy of the Shah with the theocracy of the Ayatollah Khomeini, which repudiated all Iranian/U.S. security agreements radically changing the equations of influence in the Mid-East. The Iranian revolution was an expression of a resurgence of Islamic religious zeal throughout the area, a fundamentalist revival which threatens all Arab nations which support U.S. policy, especially vis-a-vis Israel. Fundamentalists, encouraged by the success of Khomeini, have pledged to support their religious brothers by all means available to them, including terrorism, assassination, and war. Jordon, absolutely essential to any possible Arab/Israeli accommodation because of its geopolitical position and historic association with the Palestinian people, it militarily extremely weak and financially dependent upon aid from nations themselves threatened by fundamentalism. Jordon's financial and military vulnerability coupled with its political fragility make it a prime target for radical Islamic destabilization. At present, Jordon, incapable of independent foreign policy, will continue under anti-U.S. pressures unless the U.S. develops a clearer understanding of the religious/political situation in the Mid-East and devises a security assistance program for Jordon which recognizes the value and vulnerability of that nation. This will require an increase of $400-700 million a year in FMS credits and economic aid for ten years, as well as the re-assessment of the traditional unconditional U.S. support of Israeli-perceived military requirements.

535,504
AD-A153 877/6/GAR PC **A03/MF A01**
RAND Corp., Santa Monica, CA.
Challenges to Soviet Control in Eastern Europe.
Interim rept.,
J. F. Brown, and A. R. Johnson. Dec 84, 47p Rept no. RAND/R-3189-AF
Contract F49620-82-C-0018

This report summarizes and develops the findings of a project that examined the security issues posed for the United States by the likely evolution of the Soviet Bloc during the 1980s and beyond. Primary emphasis was placed on the political, economic, and social challenges to Soviet interests in Eastern Europe, as the framework for appraising the extent to which East European military forces can augment Soviet military capabilities in the late 1980s and the degree to which the Soviet army can operate in Eastern Europe unconstrained by local developments. Among the authors' conclusions are the following: (1) Poland has been pacified but not 'normalized'; latent and active opposition continues. The process of pacification has made the army the real locus of power. (2) Poland and Romania are in economic crisis, and economic problems are severe throughout the region. Nevertheless, the East European economies have developed to the point where they have no choice of improved performance if they are cut off from the international economy. (3) The decline of consumerism will contribute to social ferment and working-class frustration. (4) The USSR and local leaderships in Eastern Europe will attempt to muddle through by pursuing conservative and repressive, rather than adaptive status quo policies in the face of greater social ferment.

535,505
ED-253 193 Not available NTIS
United Nations Educational, Scientific and Cultural Organization, Paris (France).
UNISIST Working Group on Technology of Systems Interconnection. Meeting (3rd, Quezon City, Philippines, October 17-20, 1983).
Jan 84, 43p PGI-83/CONF.801/3
Annexes contain light, broken type.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Participants in the meeting summarized in this report advised and made recommendations on appropriate activities and programs conducive to the development of cooperative networks and the exchange of information and experience in science and technology in the Asia Pacific Region. Invited in their personal capacity as experts, the 14 participants came from 12 countries--Australia, Austria, Brazil, Canada, Cook Islands, India, Japan, Luxembourg, Italy, The Philippines, Thailand, and the United States. Specializations represented included computerized information systems design and development, information services provision, networkings, systems compatibility, telecommunications, and public data networks. Brief descriptions cover the election of officers, remarks of chairman Peter Judge (Australia), reports on the Asian Regional Seminar on Local Databases and Their Use (held in Quezon City, October 10-14, 1983), five technical sessions, and three group discussions on databases which focused on information systems and services, the compatibility issue, and telecommunications and networking. Recommendations are listed by topic area. Also included is a report of the sub-group on telecommunications and networking, which proposes a communications network linking UNESCO-affiliated organizations in the Asia Pacific Region. Annexes include a list of participants and related documents, the text of opening remarks by A. Neelameghan, an agenda, and an expanded summary of the earlier seminar on local databases. (LMM).

535,506
PB85-187177/GAR PC **A06/MF A01**
Agency for International Development, Washington, DC. Office of Evaluation.
U.S. Aid to Education in Paraguay: The Rural Education Development Project.
Project impact evaluation rept. no. 46,
R. L. Nicholson, and H. L. Miles. Jun 83, 117p AID-PN-AAL-017

The impact of an A.I.D. project (1970-76) to improve the availability and efficiency of rural education in Paraguay is assessed. As a result of the project, a much better educational program is available to many more students and is delivered by a system and a staff responsive to change. Although fewer rural primary schools were built than targeted (32 of 120) due to rising costs, they have greatly improved rural students' access to formal education, afforded students more time to help with farmwork, and reduced seasonal dropout and transportation costs. The project also revised primary and secondary school curricula, introduced a textbook production and distribution system, and shifted administrative responsibility from the Ministry of Education (MOE) to two Regional Education Centers. These Centers, which have conveniently been located in rural areas, have provided preservice and inservice teacher training, demonstrated use of the new curricula, helped diffuse reforms in formal education, and have become effectively decentralized units of administration.

5F. Humanities

535,507
AD-A153 688/7/GAR PC **A99/MF E03**
Carnegie Museum of Natural History, Pittsburgh, PA.
Analysis of Archaeological, Geological and Historical Artifacts and Documents Pertaining to the Midden Excavation at 'Woodville' - Unit 4, James G. Fulton, Flood Protection Project, Chartiers Creek, Pennsylvania,
J. B. Richardson, III. Mar 85, 951p
Contract DACW59-81-C-0003

Contents: An Historical Background of 'Woodville Farm'; General Setting, Location, and General Geology; Excavation Procedures; Stratigraphy; Summary of Cultural Features; Introduction to Analyzed Ceramics; Decorated Porcelain; Whiteware and Semi-Vitreous Ceramics; Yellow and Rockingham Ceramics; Ceramic Maker's Marks; Introduction to Glassware; Bottle Necks and Lip Styles; Glass Jars and Glass Jar Rims; Glass Pontiled Bases; Glass Maker's Marks and Product Labels; Miscellaneous Artifacts; Prehistoric Artifacts; Discussion of Analyzed Ceramic and Glassware Categories; Conclusions; Bibliography.

535,508
AD-A153 732/3/GAR PC **A16/MF A01**
Great Lakes Archaeological Research Center, Inc., Waukesha, WI.
Archaeological Investigations, Navigation Pool II, Upper Mississippi River Basin. Volume 1. Narrative.
Reports of investigation no. 151.
Mar 85, 353p
Contract DACW25-84-R-0014
See also Volume 2, AD-A153 733.

Combined methods of auger and coring investigations, test excavations, cut-bank surveys, archives and literature search, remote sensing, and historic mapping procedures have been applied to the development of a preliminary model of landscape evolution. The model addresses the nature, extent, and distribution of buried habitable surfaces in the Navigation Pool. Emphases are placed on the contexts in which sites are known to occur and where they can be expected to occur. In addition, certain limitations of the study are made explicit and recommendations for the resolution of these limitations are presented. In conclusion, these investigations have yielded the following: (1) survey of 14 recreation areas totaling 253 acres; (2) survey of 20 linear miles of erosional surfaces; (3) identification of 27 archaeological sites; (4) compilation of a base line cultural resources study for Pool 11 including identification of prehistoric and historic research theories; (5) development of preliminary geomorphic and cultural models; and (6) provided guidelines and recommendations for future study to resolve remaining limitations. Taken together, these data provide sufficient information relating to geomorphic and cultural contexts to identify areas where surficial compliance surveys are inappropriate.

535,509
AD-A153 733/1/GAR PC **A08/MF A01**
Great Lakes Archaeological Research Center, Inc., Waukesha, WI.
Archaeological Investigations, Navigation Pool II, Upper Mississippi River Basin. Volume 2. Data File.
Reports of investigation no. 151.
1984, 153p
Contract DACW25-84-R-0014
See also Volume 1, AD-A153 732.

Combined methods of auger and coring investigations, test excavations, cut-bank surveys, archives and literature search, remote sensing, and historic mapping procedures have been applied to the development of a preliminary model of landscape evolution. The model addresses the nature, extent, and distribution of buried habitable surfaces in the Navigation Pool. Emphases are placed on the contexts in which sites are known to occur and where they can be expected to occur. In

addition, certain limitations of the study are made explicit and recommendations for the resolution of these limitations are presented. Contents of Volume II: Scope of Week; Technical Proposal; Data Curation-Lot Check Lists; Project Correspondence; Crew Lists by Tasks and Associated Man-Hours.

535,510
DE85700497/GAR PC **A02/MF A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Influence of Climatic Oscillations in the Archaeological Sequence on Marajo Island, Brazil.
B. J. Meggers, J. Danon, J. Ferreira, and H. Valladas.
1982, 13p CBPF-NF-046/82
U.S. Sales Only.

Thermoluminescence dates define the durations of five successive archaeological complexes or phases on the island of Marajo, providing a chronology extending from about 34000 B.P. to European contact. A hiatus of 930 + - 300 years coincides with a period of aridity between about 2700 and 2000 B.P. inferred from pollen sequences in various parts of the neo-tropical lowlands, suggesting that Marajo may have been abandoned by pottery-making groups during this interval because of subsistence stress. (Atomindex citation 16:007874)

535,511
PB85-185700/GAR PC **A21/MF A01**
Northland Research, Inc., Flagstaff, AZ.
Sample Survey: Cultural Resources on Potential Agricultural Development Lands of the Gila River Indian Reservation.
Final rept.,
W. S. Marmaduke, and L. Conway. Dec 84, 487p DI-BR-APO-CCRS-85-4
Contract DI-0-07-30-X0072

In 1982, Northland Research, Inc. performed a small fraction sample survey of potential agricultural development lands on the Gila River Indian Reservation. The sample was selected probabilistically. Results suggest that, within the probability limits of the sampling design, as much as 59,687 + or - 21,272 acres of land within the 296,320 acre target area could contain significant archaeological remains requiring attention in any future development plan.

535,512
PB85-186401/GAR PC **A02/MF A01**
Delaware State Dept. of Natural Resources and Environmental Control, Dover. Technical Services Section.
Archaeological Investigations at Barnes Woods Nature Preserve,
C. L. Wise. Jan 85, 25p

The purpose of the project was to determine the nature of prehistoric and historic archaeological remains within the preserve. This information will be used in planning and interpretation.

5G. Linguistics

535,513
AD-A153 953/5/GAR PC **A02/MF A01**
University of Southern California, Marina del Rey. Information Sciences Inst.
Assertions from Discourse Structure.
Research rept.,
W. C. Mann, and S. A. Thompson. 18 Feb 85, 18p
Rept no. ISI/RS-85-155
Contract F49620-79-C-0181
Pub. in Proceedings of the Annual Meeting of the Berkeley Linguistics Society (11th), p1-14, 16-18 Feb 85.

This paper characterizes relational propositions and presents a theory of discourse structure to explain them. In their Rhetorical Structure Theory (RST), relational propositions arise in direct correspondence to particular elements of the structure of a discourse. In addition to explaining relational propostions, RST can be used to explain other text characteristics as well, and it provides a way to address a wide range of discourse phenomena. We present RST progressively during analysis of a two-paragraph political advocacy text that involves substructures for informing, giving evidence, conceeding, requesting an action, justifying a presentation, and asserting conditionally.

535,514
AD-A153 963/4/GAR PC **A02/MF A01**
SRI International, Menlo Park, CA. Artificial Intelligence Center.
Semantical Considerations on Nonmonotonic Logic,
R. C. Moore. 1985, 21p AFOSR-TR-85-0407
Contract F49620-82-K-0031
Pub. in Artificial Intelligence, v25 p75-94 1985.

Commonsense reasoning is 'nonmonotonic' in the sense that we often draw, on the basis of partial information, conclusions that we later retract when we are given more complete information. Some of the most interesting products of recent attempts to formalize nonmonotonic reasoning are the nonmonotonic logics of McDermott and Doyle. These logics, however, all have peculiarities that suggest they do not quite succeed in capturing the intuitions that prompted their development. In this paper we reconstruct nonmonotonic logic as a model of an ideally rational agent's reasoning about his own beliefs. For the resulting system, called autoepistemic logic, we define an intuitively based semantics for which we can show autoepistemic logic to be both sound and complete. We then compare autoepistemic logic with the approach of McDermott and Doyle, showing how it avoids the peculiarities of their nonmonotonic logic. (Author)

5H. Man-Machine Relations

535,515
AD-A153 677/0/GAR PC **A04/MF A01**
Air Force Aerospace Medical Research Lab., Wright-Patterson AFB, OH.
Task Battery for Applied Human Performance Assessment Research.
Technical rept.,
C. A. Shingledecker. Nov 84, 52p Rept no. AFAMRL-TR-84-071

The Criterion Task Set (CTS), V1.0 is a battery of human performance tests designed to place selective demands on the elementary mental resources and information processing functions of the human operator. Currently under development as a general purpose research tool for applied investigations of human performance capabilities, the CTS V1.0 includes nine standardized tasks which are implemented in user-friendly software on an inexpensive microcomputer system. This interim report describes the theoretical basis of the CTS, the rationale used in its construction, and the parametric research conducted to establish standard loading levels, pacing rates, and training requirements for each of the tasks. Potential research applications of the CTS are discussed as well as planned developmental efforts intended to enhance its utility. Documentation for the CTS V1.0 is provided in the form of detailed individual task descriptions and brief summaries of hardware requirements and software characteristics.

535,516
AD-A153 848/7/GAR PC **A03/MF A01**
Army Aeromedical Research Lab., Fort Rucker, AL.
Effects of XM-40 Chemical Protective Mask on Real-Ear Attenuation and Speech Intelligibility Characteristics of the SPH-4 Aviator Helmet,
W. R. Nelson, and B. T. Mozo. Feb 85, 28p Rept no. USAARL-85-2

Chemical Defense (CD) measures depend primarily on the use of protective clothing and equipment. Adequate protection only can be achieved if each item in the CD ensemble is compatible with every other item. The design or modification of each component must give consideration to its impact on the performance of all items. This study investigated the effects of the XM-40 Chemical Protective (CP) Mask on the protective functions of the SPH-4 aviator helmet. Based on the results it was concluded that the XM-40 compromised the noise attenuation and speech communication functions of the SPH-4.

535,517
AD-A153 870/1/GAR PC **A04/MF A01**
Search Technology, Inc., Norcross, GA.
Adaptive Aiding for Symbiotic Human-Computer Control: Conceptual Model and Experimental Approach.
Final rept. Oct 83-Sep 84,
N. M. Morris, W. B. Rouse, and P. R. Frey. Feb 85, 63p AFAMRL-TR-84-072
Contract F33615-82-C-0509

This report summarizes development of an experimental approach to investigation of benefits of adaptive aiding. A conceptual framework of the human-computer interface is presented, and its implications for the design of adaptive aids is discussed. The conceptual framework contains parallel elements for both the operator and the computer and emphasizes those factors expected to be important to successful cooperative task performance. A laboratory task for empirical investigation of some of the important design issues is presented. The task environment includes two competing tasks which must be performed simultaneously: a target spotting task and a tracking task. The target spotting task may be adaptively aided or not, depending on experimental conditions. This type of task was chosen for the investigation of adaptive aiding because it relies greatly on pattern recognition, an activity to which human operators and computers can both make important contributions. The tracking task is included to provide a means of varying competing workload, a factor which is expected to alter the usefulness of the aid for the spotting task. Results of pilot testing with this task are presented. (Author)

5I. Personnel Selection, Training, and Evaluation

535,518
AD-A153 619/2/GAR PC **A02/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Planning and Management Div.
OPTEMPO (Operational Tempo) and Training Effectiveness.
Professional paper,
L. Cavaluzzo. Dec 84, 23p Rept no. CNA-PP-427
Contract N00014-83-C-0725

The primary purpose of nondeployed operations is to prepare personnel for deployment. This paper looks at evidence amassed to date of the association between nondeployed activities and training readiness. For ships, activity is measured in alternative models by fuel consumption, days underway per quarter, and time spent in particular underway activities such as training, operations, and transit. For aircraft, the value of nondeployed flying hours is measured in alternative models by test scores, landing proficiency, and bombing accuracy. Results confirm a positive association between nondeployed activity and training readiness for both ships and aircraft.

535,519
AD-A153 622/6/GAR PC **A05/MF A01**
Canyon Research Group, Inc., Westlake Village, CA.
Visual and Part-Task Manipulations for Teaching Simulated Carrier Landings.
Final interim rept. 1 Sep 81-31 Aug 84,
D. J. Sheppard. 19 Mar 85, 98p NAVTRAEQUIPC-81-C-0150-9
Contract N61339-81-C-0105

A quasi-transfer-of-training study was conducted with 36 flight-naive subjects to investigate a segmentation method of part-task training, and two methods of visual augmentation, for teaching simulated carrier landings. One visual enhancement involved adding two types of descent rate information (designated RATE and COMMAND) to the FLOLS display. The experimental sequence consisted of 30 training trials with instructional feedback under a particular experimental condition, followed by 30 test trials with no instructional feedback under the criterion condition (whole task with conventional and small FLOLS). Possibly the most important finding of this study is that transfer from a large to a small FLOLS has no general detrimental effects. The fact that a larger FLOLS can provide satisfactory training will permit a less expensive approach to simulating the FLOLS. A possible difficulty with AOA control in early transfer was noted, but sufficient care in training should overcome this potential problem.

535,520
AD-A153 694/5/GAR PC **A03/MF A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Automated Maintenance System Test Program Increment VI Production Scheduling.
Final evaluation rept.,
L. J. Chambers. Oct 84, 45p AFLMC-LM760720, SBI-AD-F630 669

The purpose of this report is to document evaluation results of automated production scheduling processes within the Automated Maintenance System (AMS). The processes were developed and tested at Dover AFB, Delaware. Maintenance management functions affected by AMS Increment includes scheduling and tracking of reparable parts and items requiring calibration. Workcenters affected at the time of the appraisal included all Avionics Maintenance shops, the Avionics Reparable Processing Center (RPC), and the Field Maintenance Environmental Systems Shop. This report contains the evaluation methodology, findings and recommendations for future program development.

535,521
AD-A153 698/6/GAR PC **A06/MF A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Contract with the Institute for Curriculum and Instruction (ICI).
Final rept.,
R. Drewitt, and J. Sonnenberg. Jun 82, 117p AFLMC-801212, SBI-AD-F630 662

The Director of Maintenance Training and Management, Headquarters TAC, requested that we study the training/learning strategies developed and copyrighted by the Institute for Curriculum and Instruction (ICI) to see if the strategies could significantly improve crew chief performance. The primary objective of our effort was to have ICI demonstrate that their strategies better prepare Air Force mechanics to perform their jobs under changing conditions. Five maintenance instructors were trained in the use of the ICI strategies and then began teaching their FC and DCC courses using these strategies. Students in these courses were tracked to their flightline assignments. Their performance on the flightline, along with the performance of their assigned aircraft, were compared with a control group at each base to evaluate if the ICI approach actually improved Air Force maintenance training. Conventionally trained crew chiefs were compared with 35 ICI-trained students over a ten-month period to obtain both objective and subjective measures of performance. Several conclusions were drawn from our study. First, to evaluate the effectiveness of training, environmental changes must be considered. Second, motivation and attitudes will directly affect training results. Third, curriculum design will affect both trainee motivation and receptiveness. Fourth, ICI-trained instructors were more confident of themselves and their students, they felt better about their jobs, and they produced better graduates than the other instructors who had not received ICI training. We believe ATC should examine ICI's strategies for possible applications, e.g., instructor training courses, technical training centers, etc.

535,522
AD-A153 703/4/GAR PC **A02/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Planning and Management Div.
All Volunteer Force: Outlook for the Eighties and Nineties.
Profesional paper,
A. O. Quester, and R. F. Lockman. Mar 84, 20p
Contract N00014-83-C-0725

We have analyzed the supply of first-term military manpower from 1960 to 2000. First, we documented changed in the size of the male youth cohort over the next two decades. While the future promises smaller numbers of young men than are currently available, these reduced cohorts are not unprecedented. We tried to evaluate the quality and representativeness of the AVF, and we measured quality using the AFQT scores and high-school graduation status of military recruits. Although we found some sharp year-to-year variations in recruit quality, we found no significant differences in a force manned exclusively versus partially by volunteers. Representativeness is a more difficult problem. While it might appear that a representative military can be produced straightforwardly by conscription, the United States has not been that successful in practice. Finally, we turned to the future costs of the AVF, estimating how smaller youth cohorts will change youth wages. Drawing on established research to develop projections of these wage changes, we find, not surprisingly, that the relative wages of youth can be expected to rise. In summary, considering military demands for youthful males along with their quality, representativeness, and costs, the outlook for the AVF in the 1980s and 1990s is encouraging.

535,523
AD-A153 740/6/GAR PC **A02/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Planning and Management Div.
Costs and Benefits of Training and Experience.
Professional paper,
S. A. Horowitz, and B. N. Angier. Jan 85, 17p Rept no. CNA-PP-425
Contract N00014-83-C-0725

On-the-job training continues throughout the careers of enlisted men in the U.S. Navy. This kind of experience-induced training entails no formal training cost, but it requires payment of the higher wages and benefits due more senior individuals. This paper examines where the balance is between the costs and benefits of such training. Benefits are estimated in four contexts, three of which use measures of personnel performance based on equipment readiness. The fourth is based on supervisor evaluations. Costs are addressed in two ways: billet based and individual based. The analysis strongly demonstrates the contribution of experience-induced training and indicates that it is well worth the cost.

535,524
AD-A153 783/8/GAR PC **A07/MF A01**
Naval Postgraduate School, Monterey, CA.
Analysis of Youth Labor Force Transition Probabilities,
D. W. Harris. Dec 84, 141p

Many of the enlisted supply research to date focuses on the transition of individuals from high school to the military. Little is known of those who have chosen other options, such as further education, employment, or to remain out of the labor force completely. With the decline of the 17-21 year old male population, research must be directed towards the entire labor market. This thesis uses data from the National Longitudinal Survey of Youth to estimate the transition probabilities among seven possible states for individuals aged 17-22. The states are high school, college, active service, employment full time, employment part time, unemployment, and out of the labor force. Tests are made to determine if the transition probabilities are stable across and independent of time. It was found that the system was generally stable across time but was not independent of age and labor force industry.

535,525
AD-A153 771/1/GAR PC **A03/MF A01**
Center for Naval Analyses, Alexandria, VA. Policy and Resources Research Dept.
Evaluation of the Effectiveness of Classroom and on-the-Job Training.
Professional paper,
A. Quester, and A. Marcus. Dec 84, 36p Rept no. CNA-PP-422
Contract N00014-83-C-0725

The research reported here examines overall training effectiveness for U.S. Naval personnel; the measure of effectiveness comes from the survey responses of the supervisors of first-term enlisted Naval Personnel. These supervisors were asked about the productivity of 'typical' first-term personnel who where schooled in the classroom or trained on the job. The survey is the Enlisted Utilization Survey (EUS) conducted by the RAND Corporation for the Dept. of Defense in the mid-seventies. The EUS included over 2,000 supervisors' productivity assessments for twelve Navy occupational categories: seven of the specialties offer the alternative of formal schooling or on-the-job training. These specialties characterize a broad cross-section of Navy jobs that vary considerably in technical complexity and formal school length. The usefulness of research on training effectiveness in other areas of military manpower research is discussed.

535,526
AD-A153 793/5/GAR PC **A05/MF A01**
Naval Postgraduate School, Monterey, CA.
Application of Microcomputer Spreadsheets to Produce the US Army Five Year Field Grade Officer Promotion Plan.
Master's thesis,
H. T. Styron. Dec 84, 94p

This thesis has two specific objectives. The first is to document and explain the mathematical computations and logic used in the production of the Five Year Field Grade Officer Promotion Plan for the US Army. The second objective is to demonstrate how microcomputers and commercially available state-of-the-art electronic spreadsheet techniques can be used to produce the Five Year Promotion Plan and the flexibility this technique provides the force planner and personnel manager. The thesis proposes that the advantages of automating the promotion plan production process are significant and persuasive. Microcomputers and commercial software programs are powerful tools which can drastically increase the productivity of force planners and personnel managers at all levels. These tools will reshape the way problems are forecasted, alternatives developed, solutions analyzed, programs implemented and feedback processed to optimize the outcomes.

535,527
AD-A153 798/4/GAR PC **A07/MF A01**
Naval Postgraduate School, Monterey, CA.
Skipper Factor: Analysis of the Commanding Officer's Impact on Shipboard Reenlistment Rates.
Master's thesis,
R. E. Hewett. Dec 84, 133p

A logistic function was used to generate probabilities of reenlistment among sailors who were assigned to 17 San Diego based fast frigates from FY77 through FY83. These probabilities were compared to reenlistment behavior and the means of their residuals plotted on time lines. The graphs were then mapped against commanding officer tenures to determine if there was any correlation between the arrival of a new commanding officer and subsequent retention aboard that vessel. The plots indicated that some commanding officers may precipitate an actual 40 percent increase or decrease in retention rates adjusted for various factors. To obtain this shift with monetary incentives, a pay raise of 20 percent would be required. The use of reenlistment rates as an indicator of a commands retention ability was determined to be valid 85 percent of the time.

535,528
AD-A153 800/8/GAR PC **A06/MF A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
Analysis of the Educational Requirements of Air Force Cost Analysts.
Master's thesis,
P. Perry. Dec 84, 166p Rept no. AFIT/GSM/LSY/84S-24

The United States Air Force has emphasized a need to improve the quality of its cost estimates. It seems that cost analysts who are adequately educated can provide the high quality estimates needed by the Air Force. This thesis developed an educational requirements list for Air Force cost analysts. This list is needed to evaluate the educational qualifications of not only potential cost analysts, but current analysts as well. This list is based on an evaluation of a number of cost analysis related subjects by experienced Air Force analysts via a mail survey. Experienced analysts rated thirty-five cost analysis subjects in terms of usefulness to job performance. Analysts were also asked to identify appropriate educational methods for acquiring knowledge in the subjects. The result of this effort is an Air Force cost analyst educational requirements list by educational method. Analysis of the survey data was accomplished utilizing a computer cross-tabulation procedure which compared responses to each subject. The analysis used decision rules which measured the central tendency of the responses. Based on the decision rules outlined in the methodology chapter subjects were recommended to be taught by various educational methods.

535,529
AD-A153 817/2/GAR PC **A02/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Planning and Management Div.

Use of Flight Simulators in Measuring and Improving Training Effectiveness.
Professional paper,
A. J. Marcus, and L. E. Curran. Jan 85, 25p Rept no. CNA-PP-432
Contract N00014-83-C-0725

This paper studies the value of the aircraft simulators as measures of training readiness. Simulator evaluations are analyzed for reserves enlisted crewmen on Navy patrol aircraft. Part-time reservists are found to have very little skill loss over time and perform as well as their full-time counterparts. Experience in the simulator produces substantial increases in subsequent flights appear to be useful measures of readiness and valuable training experience.

535,530
AD-A153 964/2/GAR PC A02/MF A01
Navy Personnel Research and Development Center, San Diego, CA.
Review of the Air Intercept Controller Basic Course.
Final rept. Jan-Sep 84,
J. A. Ellis. Apr 85, 20p Rept no. NPRDC/TR-85-22

The purpose of this effort was to determine the causes of and suggest possible remedies for reducing the high student attrition rate in the AIC basic course, attrition data from the Fleet Combat Training center air intercept controller (AIC) basic course were analyzed in several ways, the knowledge and laboratory sections of the course were reviewed using the instructional quality inventory (IQI) procedures, and several issues related to the AIC course and job were examined. As a result of the course review, several recommendations were made concerning the AIC course materials and test items. Implementing these recommendations would improve course quality, but probably would not reduce academic attrition. The most effective strategy for reducing attrition would be to ensure that all students entering the course meet course prerequisites and successfully complete the preschool handbook. Students who do not meet these criteria should either not be permitted to take the course or receive remedial instruction before beginning the course.

535,531
AD-A153 999/8/GAR PC A04/MF A01
Navy Personnel Research and Development Center, San Diego, CA.
Fleet Training Requirement Analysis for Air Intercept Controllers.
Technical rept. Jan-Jun 84,
E. Joy, and J. A. Ellis. Apr 85, 56p Rept no. NPRDC-TR-85-21

This effort was conducted to validate the air intercept controller (AIC) basic course objectives and address several AIC training issues by surveying course graduates as well as members of the air and surface warfare communities. The results indicated that the overwhelming majority of course objectives were in consonance with fleet requirements for basic AIC training. In particular, the skills portion of the course was considered to be of high validity and usefulness to prospective AICs. With regard to knowledge factors taught, most respondents agreed, but to a lesser degree, that the knowledge factors are valid and useful for prospective AICs. Thirteen recommendations concerning the course content and AIC training are made.

535,532
AD-A154 013/7/GAR PC A04/MF A01
Economic Research Lab., Inc., Reston, VA.
Recruitment Early Warning System and Accession Contingency Planning Process. Phase II. Part 1.
Supplemental rept. 1 Aug-30 Sep 84,
L. Goldberg, P. Greenston, S. Andrews, and S. Hermansen. 1 Nov 84, 72p Rept no. TR-84-02-ONR
Contract N00014-83-C-0760

The REWS/ACPP (Recruiting Early Warning System and Accession Contingency Planning Process) study is the development of an interim automated information system for generating monthly Recruiting Market Assessment Reports. The system (described in Chapter IV) forecasts unemployment and high-quality enlistments for each Service, and produces tabular and graphic presentations of these forecasts, as well as supporting data useful for analyzing trends in recruiting. Regression models for enlistments and a univariate ARIMA model for unemployment are estimated in a mainframe environment, then captured in ASCII files and transferred to a micro computer environment where tables and graphs are produced. The October Assessment Report (presented in Chapter II) illustrates the outputs generated by the system. The study team has identified software which may enable the transfer of the entire system to an IBM XT in the next phase of the study. Other accomplishments include model development and further data collection (Chapter I). The enlistment forecasting models used in the REWS have been expanded: new policy variables were added, an additional model was estimated for the Marine Corps, and all models were re-estimated over an updated time period, November '78 - September '84. The study team also requested and/or collected data on advertising leads and expenditures, DEP factors, retention, and policy changes. These additional series are useful for model development or market assessment.

535,533
ED-252 172 Not available NTIS
National Advisory Council for Computer Implementation in Schools, Tucson, AZ.
NACCIS (National Advisory Council for Computer Implementation in Schools) Working Papers.
1984, 68p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Problems and issues related to the financing and use of educational technologies in Arizona schools are addressed from both short- and long-term considerations. A brief review of the spread of computers in schools includes projections for future use of computers in education and a discussion of factors affecting the market, the convergence of technologies, and emerging trends. Pro and con viewpoints on critical issues related to school use of technology are outlined, and three possible scenarios for computer implementation are described. Additional topics include problems in accounting, market variables such as price attrition, and teacher training. Recommendations are made for implementing computers and for financing their acquisition through donations by educational technology producers and citizens (e.g., through tax credit plans), federal surplus, and public resources. Financing protocols are suggested, as well as measures for capital accumulation and equalization and data entry standardization. Twenty readings are listed. Appendices include results of a survey of computer distribution in Arizona schools and charts showing the computer purchasing cycle in schools and colleges, key buyers in public school districts, and microcomputers by brand in public schools. (LMM).

535,534
ED-252 174 Not available NTIS
Computer-Related Pre-Professional Education for Library and Information Work,
A. D. Scott. Dec 83, 9p
Paper presented at the Annual Conference of the Instructional Technology and Library and Information Science Association (London, England, December 8-10, 1983).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This analysis of a research and development program conducted in the Brighton Polytechnic Department of Librarianship between 1975 and 1980 to explore the use of computer-related education in all areas of the librarianship curriculum focuses on the use of computer-based teaching packages integrated into the core curriculum, the nature and content of preliminary course units required to support computer-related core curriculum teaching, the development of a series of objectives for such a program, and the identification of factors influencing success in obtaining these objectives. Problems encountered are discussed, including the need to strike a balance between traditional course content and content reflecting environmental changes, and principles formulated are outlined. Recent advances in technology and the extent of theoretical knowledge and practical expertise now required by professionals are discussed in relation to the findings of this analysis. Seven references are listed. (Author/LMM).

535,535
ED-252 175 Not available NTIS
Jackson County Education Service District, Medford, OR.
Computers in the Schools of Jackson and Josephine Counties: A Report,
B. Brim. Aug 84, 38p
Prepared by the Southern Oregon Research and Development Committee.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The status and use of microcomputers in Jackson and Josephine counties (Oregon) were assessed in a 1984 survey of 82 school buildings. The questionnaire used sought information on the number, make, model, and distribution of microcomputers; their locations and uses within schools; the status of curriculum and student use; the identity of experts; staff training; and planning status. Based on 80 responses (98%), findings indicate the presence of more than 600 microcomputers in the schools, with only one district reporting a district-wide computer plan. Approximately 20 makes and/or models were reported, and 39% of the microcomputers were located in computer laboratories. Almost half of the schools were introducing microcomputers at the kindergarten and first grade levels, and emphasis was on computer assisted instruction for drill and practice at all levels. Instruction about computers was predominantly informal at the elementary level, with such instruction at the secondary level more often organized, sequential, and regular. Computer literacy was a common aim, and professional development was extremely important, with 86% reporting computer inservice programs. Approaches to evaluating, acquiring, distributing, and storing software varied greatly, with respondents favoring the establishment of a Southern Oregon Computer Using Education group. A list of 'computer experts' and a 19-item list of suggested readings are included. (LMM).

535,536
ED-252 176 Not available NTIS
Computers in the World of College English,
C. Tannheimer. 21 Aug 84, 81p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This sabbatical report surveys some computer software presently being developed, already in use, and/or available, and describes computer use in several Massachusetts colleges. A general introduction to computers, word processors, artificial intelligence, and computer assisted instruction is provided, as well as a discussion of what computers can do for students and teachers of English and a consideration of potential problems. Consideration is also given to software evaluation, graphics, and the social, ethical, and political implications of computers in education. Recommendations are offered for Endicott College (Massachusetts) in using computers in course work. A 40-item bibliography and 91 reference notes are included. (Author/LMM).

535,537
ED-252 177 Not available NTIS
Committee on Energy and Commerce (U.S. House).
Economic Development in Telecommunications, Computers, and Electronics: The Educational Component. Hearing before the Subcommittee on Telecommunications, Consumer Protection, and Finance of the Committee on Energy and Commerce, House of Representatives, Ninety-Eighth Congress, First Session, December 8, 1983. Serial No. 98-91.
1984, 84p
Best copy available.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report on a hearing held in Denver, Colorado, focuses on the development and impact of the electronics, computer, and telecommunications industries on the United States economy and the role of the federal government in developing these industries, including the relationship between technology and educated individuals. An opening statement by Representative Timothy E. Wirth, Chairman of the Subcommittee, addresses the health and competitiveness of these industries. A statement by Tom Lindblom, vice president of Mountain Bell, includes a summary of major Mountain Bell training and development programs, a survey report entitled, 'Non-traditional Approaches to the Training/Education Needs of Present and Future Mountain Bell Employees,' and an article, 'Looking

Ahead in Continuing Training and Education,' by W. J. Benham. Additional statments are included from Dale H. Hatfield, president, Hatfield Associates; Michael Hickey, president, Biox Technology, Inc.; Allen Meiklejohn, Colorado Senate Committee on Education; Don Weiderecht, Chairman, Colorado Advanced Technology Institute; A. Richard Seebass, Dean, Engineering and Applied Science, University of Colorado; Trenton Gary and John Pigler, on behalf of Communications Workers of America; and Michael Massarotti, Deputy Superintendent of Schools, Adams County District 50. (LMM).

535,538
ED-252 178 Not available NTIS
Kansas Univ., Kansas City.
Individualized Instruction: A Review of Audio-Tutorial Instruction, Guided Design, the Personalized System of Instruction, and Individualized Lecture Classes,
R. W. Couch. 1983, 80p
Ph.D. Dissertation.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Four methods of individualized instruction are described and introduced, and their similarities and differences are reviewed in terms of effectiveness, grading, lectures, mastery, pacing, theoretical base, and unit size. The methods described are (1) audio-tutorial, developed by S. N. Postlethwait, an instructional system that allows students to use a study carrel and proceed at their own pace using a variety of educational devices; (2) guided design, developed by Charles E. Wales and Robert Stager to teach problem-solving skills in undergraduate engineering courses, an approach that relates objectives to specific activities through single-answer and open-ended problems; (3) a personalized system of instruction, developed by Fred S. Keller, J. G. Sherman, Rodolfo Azzi, and Carolina Martuscelli Bori to teach psychology, a method that used a teaching system based on operant psychology; and (4) individualized lecture classes, initially originated at Western Michigan University by Jack Michael, which typically include study objectives, unit assignments, frequent quizzing, scheduled lectures and quizzes, and some remediation procedures. A comparative matrix, 13 reference notes, and an 8-page reference list are included. (LMM).

535,539
ED-252 179 Not available NTIS
Michigan State Univ., East Lansing. Inst. for Research on Teaching.
Future of Microcomputers in the Classroom. Occasional Paper No. 76,
J. Brophy, and P. Hannon. Sep 84, 36p
Contract 400-81-0014
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Present and potential classroom applications of microcomputers are examined in this literature review, which was conducted to identify both unjustified and well-founded claims about the advantages offered by the introduction of computers into classroom instruction. Conclusions presented indicate that: (1) such applications are being oversold by enthusiasts who make unjustified claims about the presumed need for and benefits of introducing computers to the classroom (in general) and of teaching students to program computers (in particular), and who underestimate the costs involved (in time, trouble, and money); (2) there nevertheless do appear to be applications (centering around the 'three R' functions of recursions, revision, and rapid hypothesis testing) that could allow teachers to expand or improve instruction by doing things they cannot do now; and (3) the realization of most of these applications awaits the development of software that is commonly available at an affordable cost, pedagogically sound, integrated with the rest of the curriculum in the topic area, and designed for use by the teacher working with the class rather than by the student working individually. Twenty references are listed. (Author/LMM).

535,540
ED-252 180 Not available NTIS
Evaluating CAI Material for the Microcomputer,
T. M. Ashmore. Nov 84, 14p
Paper presented at the Annual Meeting of the Speech Communication Association (Chicago, IL, November 1984). Appendix A contains marginally legible print.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The relative worth of any evaluation instrument depends on user needs and the material being evaluated. Potential users of a good computer assisted instruction (CAI) instrument include purchasers, authors, reviewers, and publishers of CAI materials. Although each user has unique needs, a good instrument will serve both to educate and discriminate, and typically addresses the biographical/bibliographical data, content data, documentation, and special characteristics of the program. This study evaluated nine published evaluation forms according to criteria that related to whether and how the forms addressed supplier data, cost, name/subject, grade level, computer type, memory requirements, program type, program accuracy, teaching aids, attention/interest, clarity of purpose, field testing, course/grade, prerequisite skills, related materials, clarity of directions, recordkeeping, graphics/animation/sound, time required, lesson difficulty, writing quality, and number of students who can use the instrument at the same time. Based on the results, an instrument was developed that combined and slightly altered the courseware evaluation instrument of the Northwest Regional Educational Laboratory and the Software Evaluation Checklist of the National Council of Teachers of Mathematics. The evaluation results, the new form, and a nine-item bibliography are included in this report. (LMM).

535,541
ED-252 181 Not available NTIS
Computers in Education; a Selection of Articles,
T. P. Metrowich. Jan 84, 16p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Computer applications in South African schools are described in this five-paper collection of journal articles, which covers a range of projects from primary school and university elementary arithmetic to more sophisticated applications in physics, chemistry, and biochemistry. 'Implementation of a System of Computer-Assisted Instruction in Arithmetic in Black Primary Schools in South Africa' (T. P. Metrowich and J. J. D. Roux) discusses the implementation of the TOAM system (a Hebrew acronym for test and practice) at five primary schools. In 'Computer-Assisted Learning in the Primary School: A South African Example,' P. Waker describes microcomputer use at the Sea Point Boys' Primary School in remedial spelling and enrichment programs. 'Microcomputers, Conceptual Change and the Design of Science Instruction: Examples from Kinematics and Dynamics' (Peter W. Hewson) explores use of the microcomputer to address students' alternative conceptions of physical phenomena through diagnostic and remedial programs. The role of the computer in education is addressed by J. D. Bradley, G. Brink, and L. Glasser in 'CAI: A Report to the Academy.' In 'Computer-Managed Instruction on the PLATO System,' G. R. Delpierre explains use of the PLATO Learning Management System at the University of the Western Cape. All papers list references. (LMM).

535,542
ED-252 183 Not available NTIS
Montclair State Coll., Upper Montclair, NJ.
Foundation and Development of Computer Assisted Instruction in the Field of Reading from its Inception to the Present,
L. K. Zuberman. Dec 83, 68p
Best copy available. A Master's Project.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This critical review and evaluation of the literature covers the field of computer assisted instruction (CAI) and reading from its inception to the present day. Seventeen research studies are discussed as well as four surveys of previous research in this field. Major issues addressed include the effectiveness of CAI and computer managed instruction as teaching tools; the effectiveness of different CAI modes; the effectiveness of CAI with respect to grade, age, and ability levels; rate of learning or time saved in learning with CAI; the retention of learning once CAI has taken place; and overall student and teacher attitudes towards learning reading skills with the aid of a computer. An appendix includes a coding sheet for the studies reviewed and a chart summarizing the research studies, presenting the reference for each study, date, research design, and methodology (especially the CAI mode and the hardware and software used). Thirty references are listed. (LMM).

535,543
ED-252 184 Not available NTIS
Interactive Video in Training. Computers in Personnel--Making Management Profitable,
P. Copeland. 1984, 7p
Photographs will not reproduce. Best copy available. Paper presented at the National Conference and Exhibition on Computers and Personnel (June 26-28, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Interactive video is achieved by merging the two powerful technologies of microcomputing and video. Using television as the vehicle for display, text and diagrams, filmic images, and sound can be used separately or in combination to achieve a specific training task. An interactive program can check understanding, determine progress, and challenge viewers to inquire. Interactive video is an extremely versatile display medium which allows the use of two communication dimensions--both information delivery and response. Systems, however, are diverse in their capabilities. The key elements of an advanced interactive video system include an authoring facility, interactive presentation, management and analysis, and hardware. Hardware can include a microcomputer; optical videodisc, capacitance videodisc, or videocassette; and, in some systems, an interface controller, touch screen, and/or printer. Training applications have been varied, ranging from medical diagnosis to information delivery and response. Systems, however, are diverse in their capabilities. The key elements of an advanced interactive video system include an authoring facility, interactive presentation, management and analysis, and hardware. Hardware can include a microcomputer; optical videodisc, capacitance videodisc, or videocassette; and, in some systems, an interface controller, touch screen, and/or printer. Training applications have been varied, ranging from medical diagnosis to 'surrogate travel.' One effective use involves using the system to show the consequences of decisions. This report lists two references and includes figures illustrating interactive video system elements and a typical hardware configuration. (LMM).

535,544
ED-252 185 Not available NTIS
Introducing a New Guided Design into the Classroom,
C. W. Allen. 1984, 12p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Based on a workshop presented by Charles Wales, a guided design project was developed for a junior mechanical design class at California State University-Chico. This course involves lectures on the design process and an extension of the basic mechanics of materials concepts, particularly as related to design and prevention of failure. The objective of the project was to develop an orthotic arm aid for paralytics which was to be operated largely under programmed control. The process included steps relating to goal establishment, information gathering, component analysis and possible solutions, constraints, choice, and analysis/synthesis. The project was completed by groups of 4 students, who met for a weekly, 2-hour activity period for 5 weeks. A group-written report and an oral report were required. The project was relatively well received, i.e., most students were enthusiastic, but wanted to be 'spoon-fed' more. Appendices contain a detailed explanation of the principal components of the design, a summary of the project evaluation, and students' individual evaluative comments. Three references are listed. (LMM).

535,545
ED-252 187 Not available NTIS
Microcomputer Use in the Schools: A Research Review,
E. J. Ogletree, and T. C. Haskins. 1983, 9p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A literature review of studies on educational computer applications and use revealed that U.S. school districts have incorporated microcomputers into both their instructional and administrative processes. Apple and Radio Shack's TRS-80 microcomputers are the two most popular microcomputers used. Mathematics and language usage are most often reported as the main instructional areas assisted by microcomputers at the elementary level, with computer literacy and programming the major use at the secondary level. Inadequate teacher training remains the consistent primary concern of school districts that use computers for instruction. Availability of quality software was also consistently reported as necessary for successful microcomputer use. Finally, the establishment of a regional clearinghouse or statewide consortia was suggested by several studies to assist school districts in seeking successful, microcomputer-assisted educational programs. The data suggest that the use of microcomputers in education must be compatible with instructional objectives of the school district, but that students must also be prepared to cope with the scientific and technological changes affecting society and the schools. Administrators need to take steps to meet these goals. Ten references are listed. (LMM).

535,546
ED-252 188 Not available NTIS
Anchorage Borough School District, Ak.
Scope and Sequence for Computer Education (Grades K-12).
1984, 124p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document outlines the scope and sequence of a school district program designed to assist students to learn to use computers and to develop positive attitudes, values, and motivation towards computers and their applications as appropriate for each individual's age, needs, and desires. A chart format is used to outline the curriculum scope for each grade for grades K-6 and the program sequence for grades K-12. Program and instructional objectives are coded to the curriculum areas of science, social studies, mathematics, and language arts/reading. The scope charts include a correlation of objectives with recommended texts, curriculum area/unit, suggested software, and other resources. (LMM).

535,547
ED-252 189 Not available NTIS
Survey of Microcomputer Use in Illinois School Districts.
E. J. Olgetree, and T. C. Haskins. 1983, 56p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A needs assessment of microcomputer use in Illinois school districts was conducted as a basis for developing resources for identifying microcomputer applications for administrative, instructional, and student purposes. A 20-item questionnaire mailed to 200 Illinois school district superintendents and administrators addressed current and potential microcomputer uses, current competencies needed by educational personnel for educational computing, type of computers being used, and the role and cooperative efforts of the State Board of Education and regional consortia in expanding microcomputer use in the districts. Responses to questionnaire items are tabulated by size and type of school district, or--for six open-ended questions--analyzed by frequency of common responses. Overall results from the 104 returned questionnaires indicate that the uses and problems of microcomputers appear to be similar in most Illinois school districts. The majority use their microcomputers for both administrative and instructional purposes, including awareness, literacy, programming, and computer assisted instruction (CAI) in all areas. Needs for assistance in CAI/computer education, better software, staff training, and funding, are indicated, as well as a lack of leadership and assistance by the Illinois State Board of Education. (LMM).

535,548
ED-252 190 Not available NTIS
Using the Microcomputer to Generate Materials for Bibliographic Instruction,
G. G. Hendley. Jan 84, 15p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Guide-worksheets were developed on a word processor in a high school library for bibliographic instruction of English and social studies students to cover the following reference sources: Facts on File; Social Issues Resource Series (S.I.R.S.); Editorial Research Reports; Great Contemporary Issues (New York Times), which also includes Facts on File Books; and Current Events Edition (New York Times). Also being developed were guides for the Congressional Quarterly's Almanac and the Congress and Nation series. Each handout explains the scope of the reference work and how to use it, and provides an exercise. Class sets of 28 questions were made for each worksheet in order to provide a different exercise for each student. Based on the administration of a questionnaire to two English classes who used the handouts and oral feedback from teachers and student teachers, the method was found to be instructionally effective and efficient, given the available staff, the number of students requiring instruction, and the frequency of class use of the library for research. The report includes five reference guides with sample questions shown, the student questionnaire, and a compilation of evaluation statements collected via the questionnaire. (LMM).

535,549
ED-252 191 Not available NTIS
Building Design and the Architect: An Instructional Module,
A. L. Wiley. 30 Jun 82, 16p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This self-instructional module presents learner objectives, text, practice exercises, and answer sheets on the development of the kind of building program that would be used by architects in designing a new building or training area for a school, college, or business. The text explains the components of a building program, including the basic educational objectives for the facility, how the programs will be implemented, curriculum emphases, times that the areas will be used, general ability level of the learners, teaching staff preferences for methods and materials, and any atypical problems of maintenance, lights, temperature, air movement, and number of students. Also addressed are the building program committee, writing the building program, the role of the instructional technologist in building program development and building design, pitfalls in building program development and design, and architectural services. A 12-item test is included. (LMM).

535,550
ED-252 192 Not available NTIS
Children Using Computers: What Are They Doing. What Are They Really Learning.
K. M. Tessmer. 1984, 13p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This survey of the literature provides a review and synthesis of research findings and current thought on the use of microcomputers by school children. Modes of learning and taxonomies of learning are described, and the results of recent surveys indicating the number of computers in schools and the amount of access by students are reported. Possible types of use are explored, including computer literacy, programming, subject specific uses, word processing, and organizational/thinking skills. Levels of sophistication of computer programs used in education are described, and the 'hidden curriculum' of computer use is discussed, including cooperative use, male/female differences, intuitive learning, and attitude toward 'right answers.' Structured use of courseware is compared with uses of computers that may stimulate creativity. Thirty-three references are listed. (Author/LMM).

535,551
ED-252 194 Not available NTIS
Extending Opportunity: Teldon Technology in Vocational Education,
A. J. Turnbull. Oct 84, 11p
Paper presented at the Annual Conference of the International Council for Educational Media (Banff, Alberta, Canada, October 8-9, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A Mechanics 12 course was chosen by the Alberta Correspondence School for a field trial of computerized delivery systems of vocational education programs to small rural schools where enrollment is low and the construction of vocational laboratories is economically impractical. The Teldon videotex system, which was initially selected, is composed of a display monitor (a television set), an interface decoder device, a telecommunication system, and a central computer. Community resources were employed to allow students to complete the practical component of the course under the supervision of a local mechanic. An evaluation addressed student attitudes toward distance education as delivered via Teldon, relative student achievement, and relative program delivery costs and results. An alternative delivery system, designed to eliminate high transmission costs, was later developed by linking a Teldon terminal to an Apple II microcomputer with a single disk drive. It was piloted in the second semester of 1983-84 with a high level of success and was favorably received by students and teachers. Additional vocational education courses on electricity-electronics and building construction are also being adapted for computer assisted delivery. Two references are listed. (LMM).

535,552
ED-252 195 Not available NTIS
German Foundation for International Development, Bonn (Germany, F.R.).
Learning at a Distance. Report on the DSE Conference (West Berlin, Germany, June 2-7, 1982) In Connection with the World Conference of ICCE (12th, Vancouver, Canada, June 8-17, 1982).
1982, 53p DOK-1131-A/a, SE-22-56-82
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Two international meetings on distance education are summarized in this report. The first, a preparatory seminar on 'Staff Development for Distance Education,' was held in Berlin to give African participants an opportunity to meet prior to attending the 12th World Conference of the International Council for Correspondence Education (ICCE) in Vancouver. Seminar activities centered around a working paper, 'Co-operating at a Distance,' in which J. Hakemulder presented practical guidelines for action oriented programs. A brief description of the ICCE conference is then provided, which includes observations on the status of distance education by representatives from Latin America, the United States, Canada, the USSR and Eastern Europe, Scandinavia, Africa, the Middle East, South Asia, the Far East, and Australia. The keynote address by Kevin C. Smith of the University of New England (Australia) is noted, and highlights of the plenary and parallel sessions that followed are given. Annexed materials, which make up about half of the report, include a list of participants in the Berlin seminar; an outline of the basic literature on distance education by B. Holmberg; the text of the keynote address, 'Putting the Student First'; and a list of documents distributed by the German Foundation for International Development (DSE). (LMM).

535,553
ED-252 196 Not available NTIS
Learning Environments: An Instructional Module,
A. L. Wiley. 30 Jun 82, 16p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This self-instructional module includes learner objectives, text, practice exercises and answer sheets addressing developments in research on learning environments and why instructional technologists should take the lead in applying the resulting knowledge to the design of training areas. Favorable learning environments are described in general terms, and specific characteristics of well-designed training facilities are described in detail. Elements covered include classroom size and shape, window and wall structure, and furniture design. The use of color and its psychological effects are also examined. A 15-item test is included. (Author/LMM).

535,554
ED-252 197 Not available NTIS
Rhode Island Coll., Providence. Dept. of Special Education.

Microcomputer Software Guide for Special Educators,
W. N. Capalbo. Jan 84, 225p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Designed to provide information to special educators on software that is available for special-needs students and to serve as a reference source for regular educators and administrators, this bibliography is divided into eight areas: reading and language arts; learning skills; mathematics; consumer education; occupational and vocational education; science, health, and safety; social studies; and miscellaneous. Software for Apple computers and the previewing policies of publishers are emphasized. Each area lists materials alphabetically by publishers' name(s) and annotations include name of material, publisher/distributor, area, grade level, description of material, price estimate, system requirements, previewing/return policy of publisher, and alternate computer compatability. A list of materials in the bibliography that are available at Rhode Island College is included, as well as information on local previewing via UNICOM. Appendices comprise software evaluation resources, guides, and model evaluation instruments, and an alphabetical listing of publishers/distributors and their addresses. (LMM).

535,555
ED-252 198 Not available NTIS
Centre for the Study of Education in Developing Countries, The Hague (Netherlands).
Popular Performing Arts, Non-Formal Education and Social Change in the Third World: A Bibliography and Review Essay. Bibliography No. 7,
R. Kidd. Feb 82, 218p ISBN-906443241-4
Document contains light type.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Intended as a tool for non-formal education practitioners and researchers in identifying a range of relatively fugitive material, this bibliography includes 1,779 references to descriptive and analytical materials concerning the use of the performing arts as a medium for education and social change in the Third World. An introductory essay offers a state-of-the-art review of such major concepts as folk media and popular theater, the various strands of educational and developmental activity, and their varying methodologies, contents, and organizational contexts. Uses of the performing arts within mass national education programs, small-scale community education/development projects, and popular movements are contrasted and compared. It is concluded that the field is much broader than the folk media programs often cited in development literature. Citations are alphabetically arranged by main entry and are accessible via extensive geographical and topical indexes. (Author/LMM).

535,556
ED-252 199 Not available NTIS
Resource Centers and Carrel Design: An Instructional Module,
A. L. Wiley. 30 Jun 82, 13p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Basic considerations in the design of carrels and resource centers are covered in learner objectives, text, practice exercises, and answer sheets in this learning module. Topics addressed include factors influencing carrel design, workspace dimensions for writing carrels and electrically wired carrels, the proper distance from the chair seat to the work surface and the common height of carrel sides, where the projected image should appear in relation to the learner, why rear screen projection is popular in carrels, rear screen projection set-ups, the relationship of viewing angle to screen, handling image reversal, avoiding background noise, controlling image size and brightness, ways of providing acoustic isolation in carrels, and equipping a carrel for computer assisted instruction (CAI). Features required by multi-purpose resource centers are listed (such as furnishings, facilities, and functional areas), with special reference to the arrangement of carrels. Four references and a 13-item test are included. (Author/LMM).

535,557
ED-252 200 Not available NTIS
Trends in Instructional Technology: An Instructional Module,
A. L. Wiley. 30 Jun 82. 23p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Learner objectives, text, practice exercises and answer sheets are provided on the history of educational technology, which includes three major periods: Audiovisual Instruction (1920-1945), Audiovisual Communications (1945-date), and Instructional Systems Analysis and Design (1950-date). The terms 'educational technology' and 'instructional technology' are defined; ideas, themes, and techniques characteristic of each period are discussed; and a few important contributors to educational technology are mentioned. The module concludes with a statement concerning the societal need for educational technology and speculation about the future of the field. A 7-item reference list and an 18-item test are included. (Author/LMM).

535,558
ED-252 201 Not available NTIS
Riverina Coll. of Advanced Education, Wagga Wagga (Australia).
Computers and School Libraries: An Annotated Bibliography. Occasional Monographs No. 1,
L. Clyde, and D. J. Joyce. 1983, 171p ISBN-0-909561-30-3
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This bibliography provides a guide to the literature available as of August 1983 on computers (particularly microcomputers) and school libraries. References include annotations of articles, books, papers, and reports written in English, and some nonprint materials (many citations are from Australian publications). The selection, organization, and use of computers and computer software in school libraries are covered, including such administrative functions as circulation, indexing, cataloging, and record-keeping, and the use of computers as educational resources. General works on computers useful to the school librarian are also cited. Entries are presented in one alphabetical sequence by author and provide information on author, title, place of publication, date, and page numbers where applicable. Annotations indicate the scope and content of the work, and in some cases provide evaluative comment. Where appropriate, references are made to works which are similar in scope and coverage, or which provide background information or a different perspective on the topic. Subject and author indexes are included, as well as a glossary of acronyms and abbreviations and a list of journals cited. (LMM).

535,559
ED-252 202 Not available NTIS
National School Boards Association, Alexandria, VA.
School/Home Computer Survey.
Jun 84, 6p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A mailed questionnaire surveyed 1,000 randomly-selected public school districts on home and school computer use. Questions addressed responsibility for the computer's introduction in educational instruction, how computers are used, the number of families with home computers, the purpose for which families are purchasing home computers, whether home computers are being used for educational purposes, and how schools are adapting their policies and procedures to facilitate instructional computing at home and school. Based on a 27% return rate, results indicate that (1) on the average, 10 to 15% of the families in the 268 districts represented owned a home computer; (2) school superintendents and principals were the driving force behind the introduction and use of computers in the schools; (3) 96% of the schools responded that their districts were currently using microcomputers for instructional purposes, including computer literacy, computer science, and computer-assisted instruction; (4) although schools agreed that the use of educational technology in the home and in the classroom would radically alter school structures and procedures, they indicated that the necessary policies, procedures, and programs to facilitate a broad and successful use of computers for educational purposes have not been developed; and (5) parents needed guidance in the selection of hardware and courseware for educational purposes. (LMM).

535,560
ED-252 203 Not available NTIS
Simulations Using a Computer/Videodisc System: Instructional Design Considerations,
L. R. Ehrlich. 1984, 16p
Paper presented at the Annual Meeting of the North American Simulation and Gaming Association (23rd, Iowa City, IA, October 10-12, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Instructional design considerations involved in using level four videodisc systems when designing simulations are explored. Discussion of the hardware and software system characteristics notes that computer based training offers the features of text, graphics, color, animation, and highlighting techniques, while a videodisc player offers all of the traditional audiovisual training media attributes of audio, running video, and still pictures. Various instructional design issues are investigated, including those relating to media characteristics and media integration, interactive videodisc simulation design considerations, and a team approach to designing and developing simulations using these systems and the required skill sets. Additional discussion briefly examines emerging technologies such as artificial intelligence and knowledge-based systems and the promise of their use with simulations. Ten references are listed. (LMM).

535,561
ED-252 204 Not available NTIS
Study on Environmental Education Films,
D. Gerba. Jul 84, 74p
Undergraduate independent study project, College of Environmental Science and Forestry, Syracuse, New York.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The degree of communication between the film industry and educators and its effect on the future directions of environmental education films are the focus of this report. Separate surveys were mailed to 100 film industry producers and distributors and 150 elementary and secondary educators in Maine, Kansas, Pennsylvania, California, and Alabama. An introduction, literature review, and description of the methodology are followed by an extensive report of the study results, which are based on a 21 percent return from the film community and a 44 percent return from the educational community. Tables for each survey question show percentage, mean ranking, and separate results from the film industry and the educational population as to their opinions on educational film topics, length, quality, audience range, markets for films, film concepts, selection purposes, formats, and so on. Conclusions indicate a serious lack of communication between the educational and film communities in regard to environmental education films. Appendices contain information on the National Association for Environmental Education 1983 film festival; copies of the two questionnaires used; a 17-item selected bibliography; and a 6-page bibliography on environmental education films for elementary schools, as well as media usage, film production, and film resource materials. (LMM).

535,562
ED-252 205 Not available NTIS
United Nations Development Programme, Bangkok (Thailand).
Regional Technical Co-operation for Training Educational Personnel in Planning and Management Using Distance Teaching and Other Techniques. Project Findings and Recommendations. Terminal Report.
30 Jun 83, 54p FMR/ED/OPS/82/270(UNDP), UNDP/RAS/77/033
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The 12-country cooperative project that is reviewed involved the following activities and outputs: group training workshops/seminars, inter-country study visits, the development of training materials for regional training programs and preparation of a training handbook, support to and development of national training programs, and evaluation. Problems related to the improvement of training materials for distance education are presented by country, and recommendations concerning material and program development and improvement

are offered. Appendices list the national institutions/programs cooperating in the project from Afghanistan, Bangladesh, India, Indonesia, Republic of Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, the Philippines, Sri Lanka, and Thailand; project staff and consultants; project equipment purchased; participants in group training courses and inter-country study visits; and units of study in training materials adapted for national training programs from the project staff development workshop lesson units. Also appended are the project budget, an analysis of evaluation questionnaires and a three-page list of reports/documents/publications. (LMM).

535,563

ED-252 206 Not available NTIS

Education and Training in the Context of a National Scientific Information Policy.

J. R. P. Alvarez-Ossorio. Sep 84, 9p

Paper presented at the FID/ET Seminar (The Hague, Netherlands, September 1984).

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This discussion of the need for, and development of, education and training for information specialists and information users in the context of national scientific information policy focuses on attempts made in Spain over the past decade to formulate a national policy for scientific information and documentation. The central objective of these attempts has been to try to solve the problem of a lack of institutional character and a lack of coordination between the various courses and schools. Self-education is cited as the main feature of the training of information specialists in Spain. Among the topics discussed are: (1) the Library and Documentation Course offered by the Center for Bibliographic and Documentary Studies; (2) a Higher Course for Documentation established by the faculty of Information Sciences of Madrid University; and (3) the proposed 'Action Plan in the Field of Scientific Information and Documentation.' The problem of user training is also considered. Finally, it is suggested that education and training problems are an area where international cooperation should play an essential role and that the programs of FID/ET (the International Federation for Documentation/Study Committee on Education and Training) and FID/II (Study Committee on Information for Industry) are extremely valuable in attempting to define the best possible solutions for the particular features of a given country. (THC).

535,564

ED-252 210 Not available NTIS

Connecticut Educational Media Association, Hartford.

Instruction in Library Media Skills. Supplement to A Guide to School Library Media Programs,

R. Morante. 1984, 123p

For related document, see ED 230 201.

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This guide, a supplement to the 1982 'Guide to School Library Media Programs,' is intended to help library media specialists, teachers, curriculum specialists, and administrators improve instruction and school effectiveness by providing an organized approach to teaching information skills in particular content areas. It is divided into three sections: the process of curriculum development, a suggested skills continuum, and sample unit and/or lesson plans. Included are general statements about the competencies that should be mastered by the students. Specific skills which must be tailored to the particular needs, goals, and objectives of the school and school district, are further refined in the 'Library Media Skills and Competencies Grades K-12' section of this guide, in which the scope and sequences for skills are analyzed to identify the appropriate grade level(s) and subject area integration for maximum student learning. In 'Skills Instruction,' 17 sample lesson plans for Grades K through 12 contain sections on objectives, activities, materials/resources, and evaluation. In addition to language arts, social studies, science and mathematics, the lesson plans deal with money, music, art, computers, health, television, sports, and attitudes toward handicaps. An extensive bibliography is included. (THC).

535,565

ED-252 213 Not available NTIS

Syracuse Univ., NY. School of Information Studies.

Study of Information Seeking Behavior of Ph.D. Students in Selected Disciplines.

Final rept.,

M. Farid. Oct 84, 126p

Contract CLR-4004

Best copy available.

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This research project investigated the information seeking behavior of Syracuse University doctoral students in six disciplines--economics, English, geology, history, philosophy, and physics. Questionnaires distributed to 112 students elicited data from 69 respondents (61.6%) on their educational environment, search strategies, selection of information channels, and demographic information. Special attention is given to the students' use of the tools and services offered by Syracuse University Libraries. Differences in information patterns among students in the six disciplines and between international and U.S. students are described, and suggestions concerning methods of library instruction are given. Several relationships were tested by statistical methods, with emphasis on those related to the students' search strategies and the material they rely on for their study or their previous knowledge of the literature. Suggestions for future research directions in this area, a 17-item bibliography, numerous tables, and a copy of the survey instrument are included. (Author/THC).

535,566

ED-252 217 Not available NTIS

Joint Committee on Printing (U.S. Congress).

Government Depository Libraries. The Present Law Governing Designated Depository Libraries. 98th Congress, 2nd Session.

Sep 84, 153p Senate-Prt-98-228

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

To aid all interested persons in the use of Government depository libraries, the Joint Committee on Printing periodically publishes a committee print providing the addresses and telephone numbers of all libraries in the system. The 1984 committee print is divided into six sections: (1) an overview including subsections on authorization, types of libraries designated, regional depositories, discontinuance of despository designation, Government publications selection procedures, disposal of Government publications by depositories, and history of early depository library legislation; (2) sections of title 44 of the U.S. Code and the U.S. Statutes at Large relating to government depository libraries and the distribution, binding, and indexing of public documents, and a U.S. map showing the number of depository libraries in each state; (3) a list of depository libraries by state and city; (4) a list of regional depository libraries by state and city; (5) a list of depository libraries by state and congressional district; and (6) a list of Government Printing Office bookstores and distribution centers by state. (THC).

535,567

ED-252 220 Not available NTIS

Coordinating Centre for Regional Information Training, Nairobi (Kenya).

Introduction of Information Science into Library Training in Eastern Africa. Expert Meeting (Dar es Salaam, Tanzania, February 26-29, 1980),

S. A. H. Abidi, and T. Moeller. 1980, 41p CRIT-Series-20/80, DSE-DOK-1042-A/a; E-28-64-80

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

In 1978 a team of three people was formed to survey the existing library training facilities in East Africa and to suggest possibilities as to how the elements of information science could be introduced either into existing programs or into special courses organized for the purpose. The team submitted its report to a joint meeting of the Coordinating Centre for Regional Information Training and the Council for Library Training in East Africa in 1979, and in 1980 a meeting of experts from the region was convened to discuss the report and to recommend appropriate action. This report on the experts' meeting comprises: (i) an introduction; (2) information on the organization of the meeting; (3) an explanation of the proceedings; (4) the resolutions and recommendations formulated by the participants; (5) a list of participants; and (6) a daily program schedule. The appendices, which make up the larger part of the report, contain four position papers and country reports presented at the meeting: 'Library Training in Ethiopia--Past and Present' (Tesfaye Aldiga); 'Library and Archives Assistants Training Programme at Kenya Polytechnic, Nairobi' (S. K. Ng'ang'a); 'Position Paper on Tanzania'; and 'Country Report: Zambia (University of Zambia).' (THC).

535,568

ED-252 221 Not available NTIS

Wisconsin State Dept. of Public Instruction, Madison.

Library Legislation. Final Report of the State Superintendent's Task Force,

D. Zweizig. Jul 84, 72p

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Prepared by the Task Force on Library Legislation appointed by Wisconsin's State Superintendent of Public Instruction, this final report presents policy statements and action recommendations addressing issues related to the organizational and funding problems of public libraries, public library systems, and multitype library cooperation. The 19-member task force comprised a mixture of citizens and professional librarians, each representing informally one or a number of areas relevant to the concerns of local government, librarians, and users of libraries. The report provides specific suggestions on: (I) improvement in the quality and equity of library services available through public, school, and other types of libraries; (2) stabilization and improvement in access to public libraries across jurisdictional lines; (3) improvement in the equity of support for public libraries by different governmental jurisdictions; (4) improvement in cooperation and sharing of resources among all types of libraries; and (5) modification and improvement of legislation relating to libraries. Appendices contain a 1985-1987 Biennial Budget Summary for State Aid for Library Development; Section 121.02(1)(h), Wisconsin Statutes; a list of issue papers considered by the task force; Chapter 43, Wisconsin Statutes; and a new formula for Public Library System Aids Estimates. (THC).

535,569

ED-252 222 Not available NTIS

Maine Educational Media Association, Old Town.

Library Skills Curriculum Activities/Objectives, K-12.

1984, 18p

Best copy available. Prepared by the MEMA Library Skills Committee.

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document presents a list of general skills for a school library skills curriculum. It is recommended that the skills be adapted for individual schools, age groups, and skill levels as are deemed appropriate by teachers and media personnel when planning and instituting a library skills curriculum. Skills and activities/objectives are reported for each of four major grade level divisions: kindergarten-grade 3, grades 4-6, grades 7-9, and grades 10-12. Within each of the first three grade level divisions, general activity suggestions are made in each of the following skills areas: library use; resources; selection; research and communication; interpretation, comprehension, and evaluation; and life-skills. For grades 10-12 activity suggestions are made for selection, research and communication, and life-skills. Appendices comprise an annotated bibliography and two sample interdisciplinary teaching units: 'Producing a Videotaped Presentation' (Sandra Fowler, James H. Bean School) and 'Contemporary World Issues' (Doris V. Chapman, Deering High School). (THC).

535,570

ED-252 223 Not available NTIS

Michigan Library, Lansing.

State Laws Relating to Michigan Libraries. Reprinted from the Michigan Compiled Laws.

Oct 84, 112p

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Prepared by the state librarian of Michigan, this compilation of laws is intended to help librarians, government officials, and citizens familarize themselves with the many state statues that affect the operation and development of libraries in Michigan. The document in-

cludes excerpts of laws pertaining to public libraries, school libraries, library networks, provisions for handicapped users, types of funding, and availability of public records. (THC).

535,571
ED-252 226 Not available NTIS
School Library Media Program's Impact on the Goals of Education: Retooling the Message,
P. M. Short. 1984, 14p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper looks at how the goals for school library media programs are aligned with the goals of education in general and what this alignment means in terms of the allocation of resources. Citing the 1983 report, 'A Nation at Risk,' it argues that there may be a disparity between the actual value of the school library media program and its perceived value by people outside the library profession. The implications of this dilemma are pointed out and an evaluation study conducted in a rural school system in North Carolina is detailed to illustrate the points made. Twenty fourth-grade students were randomly selected from each of four schools (as determined by school administrative staff and ranked according to their compliance with school library media program guidelines); two of the schools had the highest ranked media programs and two schools had the lowest ranked programs. Standardized achievement test data in the areas of reference skills and reading were then gathered for each student and T-tests were conducted to test hypotheses of group differences. Students in schools with good library media programs scored significantly higher on both reference and reading skills, suggesting that the quality of the library media program may be related to student achievement. Statistical results of the study and a 10-item bibliography are included. (THC).

535,572
ED-252 227 Not available NTIS
Coordinating Centre for Regional Information Training, Nairobi (Kenya).
Status of Information and Documentation Services in Eastern and Southern Africa and Future Prospects,
F. Inganji. Sep 83, 139p DOK-1198-c/a
Type size in the documents is small and may be difficult to read on microfiche.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This detailed report states that information and documentation services in Eastern and Southern African countries are expected to: (1) increase the efficiency of research, development, and training; (2) improve the efficiency and competitiveness of industry and technology, particularly of medium-sized and small concerns, by assisting professional and manual workers; (3) support planning and decision-making by parliament, government, administrative, and legal bodies; and (4) provide a better supply of information for individual citizens and social groups, and above all to improve their cooperation in various areas of social life. This document covers the present situation of information services in Eastern and Southern Africa; problems pertaining to the development of information services; work of some international organizations in these two regions related to information, documentation, and library development; new developments related to information and documentation services, e.g., the formation of the Southern African Documentation and Information System (SADIS); and a look at the future. (THC).

535,573
ED-252 228 Not available NTIS
Strategies for Searching. A Self-Paced Workbook for Basic Library Skills. Second Edition,
C. Hales. 1984, 30p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This self-paced workbook is designed to help students at the University of North Carolina-Charlotte acquire basic skills in using a university library. The workbook, which is used in conjuction with course assignments, is divided into six sections: (I) Introduction; (2) How to Locate Background Information; (3) How to Locate Books; (4) How to Locate Periodical Articles; (5) How to Locate Newspaper Articles; and (6) How to Get Help at the Reference Desk. Each section has an explanation of its purpose and content; all sections except the first and last have a series of exercises. A library-specific guide to the location of reference materials is included. (THC).

535,574
ED-252 229 Not available NTIS
Zimbabwe Government Library Service, Salisbury.
Use of Information and Documentation for Planning and Decision-Making. Summary Report and Proceedings of Joint ESAMI/PADIS/DSE Seminar (Salisbury, Zimbabwe, August 3-7, 1981),
T. Moeller, and B. L. B. Mushonga. Aug 81, 123p
DOK-1099-A/a, S-28-68-81
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The aim of this seminar was twofold: to make senior civil servants of Zimbabwe aware of the importance of information and documentation for planning and decision-making, and to introduce the concept of a national information and documentation center (NIDC) as designed by the United Nations Economic Commission for Africa, Pan-African Documentation and Information System (ECA-PADIS). The first half of the seminar was devoted to user education and the promotion and design of a national Zimbabwe information and documentation program. The second half was devoted to special issues of the PADIS concept, including computer requirements, information storage and retrieval techniques, and document analysis procedures. This report includes the proceedings, recommendations, and results of the seminar; the program; a list of participants, lecturers, and staff; reprints of three articles on the seminar that appeared in 'The Herald'; and the following addresses and papers: (1) 'The Use of Information and Documentation for Planning and Decision-Making' (Dr. F. M. Shava); (2) 'A National Library Service as a Focal Point for an Information and Documentation Service for Planning and Decision-Making' (J. L. Culverwell); (3) 'The Need for a National Information and Documentation Centre (NIDC) in Zimbabwe' (M. Malianga); (4) 'The Role of Libraries, Information and Documentation Centres in National Development' (O. T. Mupawaenda); (5) 'Information and Documentation Services in Zimbabwe' (B. L. B. Mushonga); (6) 'The Concept of a National Information System in Zimbabwe' (S. R. Dube); (7) 'Some Notes on the Use of Data for Planning and Decision-Making' (G. M. Mandishona); (8) 'Role of Information in Decision-Making' (A. Musana); (9) 'Information Processing: Coping with the User's Needs' (F. Inganji); (10) 'Planning Economic Growth with Equity and Implications for Data Systems' (T. R. Muzondo); and (11) 'The Computer System Requirements for Zimbabwe's PADIS--NIDC Proposals' (N. B. Chitepo). (THC).

535,575
ED-252 232 Not available NTIS
Wisconsin State Historical Society, Madison.
Midwest State Archives Guide Project: An Evaluation.
Final rept.
M. J. Evans. Sep 82, 65p
Grant NHPRC-80-8
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document serves as the final report to the National Historical Publications and Records Commission (NHPRC) of the work of the Midwest State Archives Guide Project. The project involved the state archives in Minnesota, Illinois, Indiana, and Wisconsin, and was expected to contribute to a projected national guide project database, though when the project began there had been little systematic planning for a national information system outside of the NHPRC staff. This report describes the purposes of the project, its successes, and its problems, and examines alternative approaches to an archival descriptive database. It also addresses the goals of the project as described in the grant application, and notes how outside events made some of the goals irrelevant, or caused the project team to change their emphasis. Appendices, which make up more than half of the document, comprise: (1) Publications and Papers Generated from Participation in the Midwest State Archives Guide Project; (2) A Comparison of Natural Language Access and Assigned Term Indexing; (3) Data Base Design; (4) Style Sheet; (5) Data Entry Forms Used during the Project; (6) Illinois County Records Approach and Data Base Design; and (7) Sample of Wisconsin and Minnesota Reports. (THC).

535,576
ED-252 234 Not available NTIS
Classification of Learning Assistance Center Materials,
E. L. Wuertz. 1984, 50p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A study undertaken to find a satisfactory system of classifying and organizing materials for college or university learning assistance centers discovered that little information had been published. Further investigation revealed that the two major systems used in libraries, the Library of Congress (LC) and Dewey Decimal Systems, were found to be inadequate by learning assistance practitioners. As an alternative to those systems practitioners frequently employed a modified LC scheme or used very broad mnemonic topic designators. No system available was deemed sufficient for a well-developed, comprehensive collection of learning assistance materials. A detailed guide for an alternative scheme for classifying materials and building call numbers which was devised is attached to this paper. Based on the comprehensive curriculum of the California State University at Long Beach and on the materials collection developed during several years of operation of the University Learning Assistance Center, this scheme reflects the special interests and concerns of learning assistance centers. (Author/THC).

535,577
ED-252 236 Not available NTIS
Education in Technical, Non-Academic, Librarianship in Israel. The Course for Special Libraries-Level B,
E. Hoffmann. Sep 84, 9p
Paper presented at the FID/ET Pre-Congress Workshop (The Hague, Netherlands, September 17-20, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper describes a series of courses in technical librarianship in Israel. Upon successful completion of these courses and the relevant examinations, students receive certification as non-academic librarians from the Israel Library Association's special educational committee. Two levels of courses are briefly described: Level A--the basic level--is intended to teach the rudiments of librarianship for beginners and consists of one course, uniform in structure and suitable for further education in all kinds of libraries; Level B courses are divided into two parts, public and school libraries, and special libraries. Information on qualifications for enrollment, duration of the course, subjects of instruction, and methods of instruction is supplied for both Course A and Course B. The remainder of the paper details Course B, Special Libraries, and includes information on the character, students, and contents of Course B. Revisions and modifications for Course B (to be implemented in the autumn of 1984) are described, including the introduction of modern methods of information handling and streamlining of the subject content. (THC).

535,578
ED-252 238 Not available NTIS
State Univ. of New York at Albany. Office of Institutional Research and Analytical Studies.
Academic Library Statistics. Fall 1980, Fall 1981, Fall 1982, Fall 1983. Report Number 12-84.
Dec 84, 130p
For an earlier report, see ED 195 236.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report comprises the responses of the constituent institutions of the State University of New York (SUNY) to the library questionnaires of the Education Division of the United States Department of Health, Education and Welfare and the New York State Education Department, for Fall 1980, Fall 1981, Fall 1982, and Fall 1983. Included in the statistical tables are data on library collections, staff, operating expenditures, and loan transactions for each institution. Fall 1982 data on developmental areas and mean salary of full-time library staff are included. Additional summary tables include available trend data for Fall 1980 through Fall 1983. In order that the statistical data may be reviewed in relation to user demand for the library services, en-

rollments for each college and university are provided for the years surveyed. Introductory materials provide definitions of terms, and appendices include a map showing locations of SUNY institutions and a publications list of the Central Staff Office of Institutional Research. (THC).

535,579
ED-252 239 Not available NTIS
Computer Based Library Orientation,
R. Machelow. 1984. 44p
Best copy available.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document presents computer-based lessons used to teach basic library skills to college students at York College of the City University of New York. The information for library orientation has been entered on a disk which must be used in conjunction with a word processing program, the Applewriter IIe, and an Apple IIe microcomputer. The lessons provide instruction in four basic areas: the card catalog, indexes, periodicals, and locating books on the shelves. Throughout the lessons, students are instructed in the basic areas and are required to load the various sections into the computer's memory. Thus, the student actively participates in the educational process. Step-by-step lessons are accompanied by sample library cards, excerpts from periodical indexes, and library-specific microfilm holding lists. (THC).

535,580
ED-252 244 Not available NTIS
Illinois State Library, Springfield.
Interlibrary Loan before and after OCLC. Illinois Valley Library System OCLC Experimental Project. Report No. 7,
L. G. Bills. Dec 84, 131p
For related documents, see ED 241 011, ED 241 055, ED 241 063, and ED 250 004.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

From January 1980 through December 1982 the Illinois Valley Library System (IVLS) and 33 of its participating libraries conducted an experimental project to test the costs and benefits of OCLC use in small and medium-sized libraries. This report, one of eight describing the results of the OCLC Experimental Project, examines interlibrary loan activities before and after the OCLC interlibrary loan (ILL) subsystem was used in the project libraries. Comparisons are made in terms of time, costs, and staffing levels. The second part of the report examines resource sharing patterns in the IVLS and how they changed during the project. Finally, the attitudes of library staffs toward online ILL are reviewed. Multiple graphs, tables, and figures summarize the data. Appendices include the following: (1) statistical information on project libraries; (2) IVLS Interlibrary Loan Protocols and Summary Card for Terminal Operators; (3) IVLS Request Form and Flow Chart of IVLS Interlibrary Loan Department Procedures; (4) Transaction Study Form; (5) IVLS Interlibrary Loan Department Worklog Study Form and Instructions; (6) Library Interlibrary Loan Worklog Study Forms and Instructions for Terminal Activities and OCLC-Related Work; and (7) Library Log Form for Non-OCLC Interlibrary Loan Activity. (THC).

535,581
ED-253 192 Not available NTIS
Titles 1984: The Classroom Teacher's Guide to ERIC. Computer Education, 1983. Level II, 1983. Occupational Reference, Occupational Resources, 1983,
R. A. Mecagni. 1984, 59p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The 'Titles' information system reviews annually the documents entered into the ERIC data base in order to identify the highest quality instructional resources. This catalog lists a total of 869 teaching guides and learning guides selected from the ERIC input during 1983 as especially suitable for direct use by teachers, students, parents, and guidance personnel. The catalog is divided into three sections: (1) Elementary (282 documents); (2) Secondary (374 documents); and (3) Occupational (278 documents). Within each section, the titles are listed under broad subject categories. Information on obtaining the documents, either from ERIC or from 'Titles', is provided in the introductory matter. (LMM).

535,582
ED-253 194 Not available NTIS
Special Effects and Their Perhaps Unusual Use in Educational Television,
G. Abouaf. 1983, 42p
Paper presented at the Annual Meeting of the Educational Television Association (York, England, 1983).
Photographs will not reproduce.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The role of the British Broadcasting Corporation (BBC) in supplying television educators with teacher aids, models, and devices is described in this report, which emphasizes the work of special effects or visual effects technicians and explains how difficult concepts and principles can be demonstrated through the use of three-dimensional models, demonstrations, and computer-linked devices. Comparisons are made between educational and non-educational television and the film industry. Additional topics addressed include the organization and history of the departments of visual effects within the BBC, the training of technicians, and the use of visual effects in educational television and the Open University. Examples of models and demonstrations developed are provided, as well as a list of services offered to Open University program developers and discussions of the skills required by the special effects technician; models, model making, and demonstrations; table top models and the new technology, including the use of endoscopes, periscopes, and computer graphics; and uses of visual effects in drama production. (LMM).

535,583
ED-253 195 Not available NTIS
Bank Street Coll. of Education, New York. Center for Children and Technology.
Functional Environments for Microcomputers in Education,
D. Newman. May 84, 15p CCT-TR-25
Paper presented at the Conference on Microcomputers in Education (Tokyo, Japan, January 8, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A research program was undertaken to study the functional learning environment (FLE) in which computers operate, i.e., those environments in which learning activities have a function or purpose from the child's viewpoint. Results of three projects illustrate the importance of teachers in creating and interpreting children's learning environments. The first project was designed to determine whether experience with LOGO programing would enhance third and sixth grade children's planning skills; no effects on planning were found. The second project involved one aspect of the Bank Street College Project in Mathematics and Science Education, in which a FLE is based on a multimedia simulation of a science show. Results indicated that the materials were successful from the children's viewpoint, while teachers' evaluations were mixed. The third project investigated whether networking can be used as a FLE for writing and communication. The three studies raise fundamental questions about the design and implementation of FLE's, particularly the relationship between the children's purposes and those of their teachers. It is concluded that coordination of divergent purposes within a FLE is a critical factor in the success of classroom microcomputer activities. Twenty-one references are listed. (LMM).

535,584
ED-253 196 Not available NTIS
Distance Education: A Nigerian Perspective. Educational Technologies to Enhance Learning at a Distance,
F. Z. Gana. Oct 84, 40p
Paper presented at the International Conference of the International Congress of Educational Media (Banff, Canada, October 8-9, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Patterns of distance education in Nigeria are surveyed in this report, and the level of application of educational technology to enhance learning is addressed. Following an analysis of the concept of distance education and the need for such a system in Nigeria, three patterns of distance education are identified and discussed: those depending solely on print correspondence; those that are multimedia-based but dependent heavily on broadcast media; and those using print and study centers. Programs and methods used in Nigeria are described, including correspondence education; the University of the Air; the National Teachers Institute (NTI); the Correspondence and Open Studies Institute (COSIT), University of Lagos; Teacher In-Service Education Program; Nigeria Certificate of Education (N.C.E.) by correspondence; and the National Open University. Additional aspects and problems discussed relate to dominance of the use of printed course materials, long face-to-face teaching sessions (or contact sessions), study centers, and course offerings and entry qualifications. It is concluded that distance education in Nigeria is having the desired impact. Included are 19 notes and references, a 28-item bibliography, a categorization of unqualified teachers, correspondence college accreditation requirements, and lists of the Institute of Technology (IMT) University of the Air programs and COSIT courses. (LMM).

535,585
ED-253 197 Not available NTIS
Adequacy of Microcomputer Courseware Teachers Guides,
A. Woodward. Apr 84, 20p
Best copy available. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 23-27, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The content and quality of the documentation and teachers guides that accompanied 55 educational microcomputer software programs were examined, to determine whether the technical and pedagogical information provided by such guides enabled teachers to fully exploit the instructional potential of the programs. The courseware covered basic elementary and secondary subject areas, and 50 were single disk programs. Results indicated that the multi-disk, multi-level program guides were similar to the single disk guides but did not reflect the complexity of the programs they represented. Most guides adequately covered needed technical information but contained limited pedagogic information. Lack of comprehensive documentation may result in serious school and classroom implementation problems. Faced with an unfamiliar technology and a lack of prior experience in which to place and integrate microcomputer software, teachers will be faced with using a trial and error approach in exploring basic computer applications. This report includes definitions of technical and instructional terms, examples of inadequate and exemplary treatment of elements helpful in using instructional software, and a table of instructional and technical characteristics on which the documentation and teacher guides were rated. (Author/LMM).

535,586
ED-253 198 Not available NTIS
Artificial Intelligence and Its Importance in Education,
M. J. Tilmann. 1984, 33p
Independent study paper, Michigan State University.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Artificial intelligence, or the study of ideas that enable computers to be intelligent, is discussed in terms of what it is, what it has done, what it can do, and how it may affect the teaching of tomorrow. An extensive overview of artificial intelligence examines its goals and applications and types of artificial intelligence including (1) expert systems, e.g., MYCIN, a rule-based system program that can diagnose infectious diseases and recommend treatment, and XCON, an expert system that synthesizes information; (2) language understanding, e.g., the program ELIZA which carries on a conversation with the user much as a psychiatrist would; (3) image understanding and robotics, e.g., CONSIGHT, a program that uses binary images to locate objects in a conveyor belt; and (4) learning, i.e., the computer's ability to learn. Specific artificial intelligence developments in the field of education are described, including the program WUSOR, which was written to advise users of the game WUMPUS, a maze-exploration program that encourages deductive processes and develops a sense of probabilities. The final

summary reviews the good qualities of computer assisted instruction programs and suggests ways in which artificial intelligence could aid or be incorporated in their development. Twelve references and twelve items of supporting literature are listed. (LMM).

535,587
ED-253 199 Not available NTIS
Open Univ., Milton Keynes (England). Inst. of Educational Technology.
Audio-Visual Media in the Open University: Results of a Survey of 93 Courses. I.E.T. Papers on Broadcasting No. 224,
H. U. Grundin. Jul 83, 36p
Document contains small print.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The survey reported here of 12,008 students in 93 undergraduate Open University courses was designed to assist in Open University audiovisual policy development and planning and to provide a data base for summative evaluation of audiovisual media use in individual courses. Emphasis was on the first aim, and detailed data were collected only for 17 new courses. An introduction describes the sampling, response rate, weighted averages, and availability of survey data. Tables show student access to audiovisual equipment (television, video equipment, audiocassette equipment, and telephone), and to computers, including type of microcomputer and data storage medium. Results reported cover the use and appreciation of television and radio in foundation courses and in new courses, the role of television repeats, broadcasting versus cassette-mailing as a distribution method, use and appreciation of audio-cassettes, the cost of television, the economy of television in post-foundation courses, television versus face-to-face tutoring, television versus audio-vision, and media selection from a cost-benefit perspective. Recommendations, four references, and a list of courses covered in the survey are included. (LMM).

535,588
ED-253 201 Not available NTIS
Harvard Univ., Cambridge, MA. Harvard Project Zero.
Computer as Educator: Lessons from Television Research,
G. Salomon, and H. Gardner. 1983,39p
A Project Zero technical report.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The 'symbol systems approach' to the study of computers in education that is outlined avoids the pitfalls of past media research--particularly research on the effects of television on children's learning and knowledge--and asserts that media can be usefully distinguished in terms of the symbol systems they present and the kinds of symbol-using skills they evoke, afford, or inculcate. Early media research questions are criticized for their naive assumptions, inadequate distinctions, and the researcher's zeal to generate answers rapidly. A summary of the implications of the symbol systems approach suggests that (1) every medium, including the microcomputer, will favor the transmission of certain symbol systems over others and is likely to require and cultivate different representational skills; (2) every medium is biased toward specific kinds of activities applied to its symbol systems, and is likely to cultivate a different set of mental operations; and (3) subjects will bring different expectations to different media. Twenty-four references are listed. (LMM).

535,589
ED-253 202 Not available NTIS
Boston Public Schools, MA.
Computer Education: A System-Wide Approach,
M. Gardner. Dec 83, 74p
Paper presented at the Annual Convention of the American Vocational Association (Anaheim, CA, December 2-6, 1983). Some appendices may not reproduce well due to light and broken type.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Based on the experiences of the Boston Public Schools (BPS), this document offers guidance in the organization and development of a system-wide approach to an extensive expansion of computer technology. The following topics and steps in the process are addressed: identifying the present status of a school system's computer education program; developing a position paper; establishing a computer-policy committee; identification of priority issues, including funding and professional development; curriculum; software purchase and evaluation; hardware procurement and dissemination; maintenance and security; parent and student activities; allocation of computer equipment; support and instructional personnel; dissemination of information; regional and national contacts; private business and industry involvement; aggressive goals; developing a status report; and future policy recommendations. Appendices comprise a 3-year financial plan; a Computer Onsite Inservice Program Evaluation Checklist; a list of professional development computer courses for 1983-1984; descriptions of sample software programs; a computer implementation action plan; a diagram of the BPS Computer Education Support Personnel organization; a copy of an issue of BPS Computer News; and an article entitled 'Boston Schools Launched into the Computer Age.' (LMM).

535,590
ED-253 203 Not available NTIS
Further Education Unit., London (England).
Computer Literacy. Unit One. General Guide. Second Edition,
J. Lloyd. Oct 84, 72p
A Staff Development Publication. For Computer Literacy. Unit Two, Core Materials, see CE 040 025.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This booklet, the first of a four-unit series on computer literacy, provides general guidance on establishing and conducting computer literacy courses, whether as components of other courses or as free-standing courses. An overview of computer literacy in the context of education and training and of guidelines for its implementation is followed by a discussion of the resources needed for conducting courses, including hardware, software, audiovisual resources, facilities, and staffing. Suggestions are offered for initial, continuing, and integrative staff development. A description of 57 teaching modules developed to implement computer literacy aims and objectives includes a list of the modules in 10 categories: introduction; computer basics; understanding programs; business, office, industrial, and other applications; social implications; visits; and assessment. Care modules are denoted by an asterisk and a step-by-step guide to module use is provided. Class management strategies are described for two of the teaching modules, 'Writing a Program' and 'Using a Business Package.' A final discussion on assessment describes a strategy that has been incorporated into the course and summarizes the strategy's effectiveness and resources required for its implementation. Appendices include a list of colleges associated with the sponsoring project and a glossary of computer terms. (LMM).

535,591
ED-253 205 Not available NTIS
Open Univ., Milton Keynes (England). Inst. of Educational Technology.
Design Implications of Audio and Video Cassettes. I.E.T. Paper on Broadcasting No. 222,
N. Durbridge. 1983, 41p
Best copy available.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This discussion of the educational potential of audiotape and videotape cassettes in distance teaching considers each medium individually, with examples of how the Open University has tried to exploit them in its teaching, and comments on some major differences between the two media and their implication for education. Characteristics of audiocassettes are addressed first, including their ability to convey certain kinds of abstract information quickly, their informality and flexibility, and the relative ease of their design and production for academic staff. Potential educational applications noted include their use for direct teaching, as support material (either to other components or to students themselves), as an audio resource, and for delivering straight talks. In considering video, the content and structure of one Open University video program is described. Aimed at teachers, this program used real-life school scenes of children learning mathematics. Other educational uses of video are considered, and it is concluded that video can work as a catalyst for group discussion, and that videos that are designed to use the 'stop-start' capabilities of the technology will be effective for individual use by students. An analysis of the differences between audio and vidocassettes indicates that audiocassettes are currently more valuable as an educational tool. (LMM).

535,592
ED-253 206 Not available NTIS
Evaluating the Individualized Learning Lab (1),
T. B. Yarborough. 12 Dec 84, 12p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The Learning Laboratory component of the Department of Educational Program Support at the University of Wisconsin at Parkside was evaluated during the academic year 1983-1984 to monitor laboratory and material usage, determine from what areas students were referred, and identify their reasons for laboratory use. The laboratory was part of a support program for diagnosing students' problems and developing or remediating their skills in English, writing, math, reading, and study skills. Using the laboratory log and a learning laboratory participation report completed by 357 students, it was determined that out of 1,785 laboratory uses recorded, the majority of students (82%) were sent from freshman writing classes. English grammar and usage skills resources were the most used (77%). Materials were also rated by students on appeal, pace, learning value, clarity, and importance of learning. The results suggest that students are generally pleased with the laboratory facilities and resources, but that, although the laboratory was publicized, few students above the freshman level made use of it. This report includes the Learning Lab Participation Report form completed by students. (LMM).

535,593
ED-253 207 Not available NTIS
Gaming Approaches in Educational Software: An Analysis of Their Use and Effectiveness,
J. J. Dunne. 1984, 13p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The use and effectiveness of gaming techniques in educational computer software was investigated through an analysis of 170 in-depth evaluations of commercially-available educational computer programs. These evaluations, conducted by the Educational Products Information Exchange (EPIE) Institute, dealt with design attributes relevant to all programs as well as attributes relevant only to the gaming aspects of a program. General coding categories were copyright date, subject area, intended users, instructional approach, EPIE rating, and gaming. Gaming-related attributes coded were motivation, effectiveness, interactivity, confusion, and arcade (whether the gaming aspect of the program employs techniques used in video arcade games). Results indicate that gaming is now a major and increasingly-prevalent technique being used in the design of educational computer programs. The motivational appeal of gaming programs was consistently high, while their effectiveness varied depending on the context in which they were used. It is suggested that the instructional impact of educational computer games may be maximized by carefully matching specific gaming techniques to such factors as the content, instructional approach, and users of a program. Nine references are listed. (LMM).

535,594
ED-253 208 Not available NTIS
Open Univ., Milton Keynes (England). Inst. of Educational Technology.
Implications for Teaching and Learning of New Informatics Developments. I.E.T. Papers on Broadcasting No. 233,
A. W. Bates. Sep 84, 11p
Paper presented at the Annual Conference of Higher Education International (1st, York, England, September, 1984). Best copy available.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

By the year 2000, European higher education institutions must achieve the following aims: resolve the conflict between the social demand for education and costs of higher education without lowering standards; provide continuing education to cope with rapid technological change and increased leisure and/or unem-

ployment; build even closer links between industry, public services, and higher education in the field of informatics; and infuse new talent into static academic manpower. Informatics (varied new communications technologies that are based around microprocessing and optics) may enable the achievement of those aims. The move to distance education and independent learning will accelerate through computer conferencing, cable television and videocassettes, computer-based audiographic systems, and interactive videodiscs. New technologies offer an alternative model to the large, centralized specialist system, because they are both easy to access and easy for teachers to use. The technology needed to achieve these aims is here now, and will become increasingly easier to use. The main barrier is the inability of large institutions to carry through the fundamental changes in organization, financial arrangements, and teaching strategies that are essential if flexible, off-campus teaching is to be achieved. Eight references are listed. (LMM).

535,595
ED-253 209 Not available NTIS
Volunteer Centre, Berkhamsted (England).
Implications of Cable and Satellites for Social Action and Educational Broadcasting. Media Project. A Seminar Report,
J. Cain. 20 Jan 83, 35p
Proceedings of a Seminar held at the Volunteer Centre (Berkhamsted, England, January 20, 1983).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

An invitation-only seminar was held on January 20, 1983 to share knowledge, concerns, and ideas on the implications of cable and satellite for social action and educational broadcasting. An introduction by John Cain noted that, although the primary seminar focus was cable and satellite, other important developments could be equally important, including videocassettes, videotex, small computers, and tele-software. John Howkins, in a presentation entitled 'The Potential of Cable and Satellite,' offered predictions on the future of British cable television. In 'Social Action and Education--the Implications of Cable and Satellite,' Robin McCron argued that cable should be of more concern for social action and education broadcasting. Related discussion addressed the spread of cable coverage, cable as a local service, educational services through cable, the role of unions, the question of copyright, and the impact of interactivity on existing broadcasting services. Robin Moss presented 'Views on the Day,' concluding that education is changing under the same types of pressures that are changing broadcasting and communications. Appendices include a summary of related events and government decisions for 1982, a list of some important Hunt Committee recommendations, a nine-item reading list, and three papers: 'Satellite and Cable--The Background,' 'Cable Television in the United Kingdom,' and a follow-up paper for seminar participants. (LMM).

535,596
ED-253 210 Not available NTIS
Importance of Context When Studying the Impact of Instructional Television,
J. R. Sanders. Oct 83, 20p
Paper presented at the Joint Annual Meeting of the Evaluation Network and Evaluation Research Society (Chicago, IL, October 1983).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

To develop a conceptual framework for understanding the environmental variables that affect the impact of classroom television, the use of the instructional television series 'ThinkAbout' (Agency for Instructional Television) was studied under natural classroom conditions using observations recorded as part of a series of studies conducted during the 1979-1980 school year. In order to provide conceptual organizers for the contextual factors identified in the study, findings were categorized by influences related to: (1) the school organization, such as pressures of accountability, the school schedule, and unscheduled interruptions; (2) the teacher, including preparation, teaching style, and enthusiasm; (3) the teaching process as an adjunct to the series itself; (4) the students, including their attitudes toward television as a learning medium and their expectations for television programs; and (5) influences of the distribution system such as dependency on public broadcasting station schedules and delays in receiving copies of the teacher's guide. The studies provided data on a rich variety of contextual influences, a clinical understanding of previously unmeasured individualized effects occurring in classrooms, and the finding that teachers are not a good source of data on how educational television is used. Fourteen references are listed. (LMM).

535,597
ED-253 212 Not available NTIS
Victoria Univ. (British Columbia).
Investigation of Attitudes towards the Use of Computer Games and Simulations in the Primary/Elementary Classroom Environment.
J. E. Godfreyson. Aug 84, 162p
M.Ed. Thesis.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report summarizes an investigation of the attitudes of elementary students, teachers, and parents toward the use of educational computer games and simulations in a teaching/learning situation. Following a statement of the project purpose and a literature review, the courseware selection process is described. (This process resulted in use of the game, 'Hurkle,' in two primary classes and use of the simulation, 'Oh, Deer,' in two elementary classes.) Additional sections cover implementation of the project, observations related to student progress, teacher evaluations of the implementation guides developed for use with the courseware, design of the attitudinal survey, and data analysis procedures. All of the attitudinal surveys involved the investigation of four main themes: enjoyment, perceived learning effectiveness, group interaction, and interaction with the computer/program. Additional questions varied with the respondent group--students, parents, and teachers--and the results are analyzed and interpreted separately for each group. Implications for teaching and school practice are examined. A 35-item bibliography, the two implementation guides developed for the study, attitude surveys, a detailed data summary, and evaluations of the two courseware packages are appended. (LMM).

535,598
ED-253 213 Not available NTIS
City Univ. of New York. Office of Academic Affairs.
Microcomputers and Teaching English as a Second Language. Issues and Some CUNY Applications. Research Monograph Series Report No. 7,
G. M. Dalgish. Sep 84, 58p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This review focuses on microcomputer software designed to improve the writing skills of students of English as a Second Language (ESL) at the college level. It presents a case for the use of computers in teaching ESL, provides guidelines and suggestions for evaluating or creating software and programs, and reviews representative software, including materials from the Minnesota Educational Computer Consortium, Regents/ALA, BIPACS, Dormac, Computer Curriculum Corporation, Hartley, Teacher's Friend, and PLATO. The applicability of such word processing packages as Bank Street and Franklin AceWriter to the ESL class is addressed. Quality control in ESL software development is urged, and methods of achieving such control are outlined. Several specific computer assisted instruction (CAI) projects currently in the planning stage or already underway at the City University of New York are specifically described, as well as research on the use of computers in teaching ESL. An informal glossary of computer terminology and a list of sources and resources are included. (LMM).

535,599
ED-253 214 Not available NTIS
Microcomputer Training Model for Training Teachers,
F. F. Midkiff. 1983, 26p
Paper presented at the Conference of the National Association for the Education of Young Children (Atlanta, GA, November 1983).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A model for designing efficient teacher training in computer literacy and usage should begin with preplanning to consider the goals, objectives, and purposes of the training; the needs of the teacher/student; the content and sequence of information to be taught; and careful evaluation procedures for use in further planning. Planners must recognize that teachers may have psychological, mathematical, mechanical, and professional fears concerning the computer and their own abilities. A needs assessment can determine both what teachers want to know and what they need to know. Assessment questions for teachers should focus on introduction to the microcomputer, the effect of computers on society and education, and what knowledge and skills are needed to make effective use of microcomputers in the classroom. The training should include sessions covering: (1) an introduction to the computer and an overview of the state of the art; (2) planned instruction in computer literacy; (3) systematically-designed programs for individual instruction; (4) techniques for working with children in the classroom; and (5) knowledge of the administrative uses of the computer. This report includes a sample teacher questionnaire for assessing training needs and a 27-item bibliography. (LMM).

535,600
ED-253 216 Not available NTIS
Open Univ., Milton Keynes (England). Inst. of Educational Technology.
Selecting and Designing Low-Cost Media for Distance Education. Papers on Information Technology No. 238,
A. W. Bates. Oct 84, 23p
Paper presented at the Zentrales Institut fur Fernstudienforschung (Hagen, West Germany, October 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper argues that recent developments in technology hold considerable promise for distance education. Audiocassettes, audiographics (the combining of natural sound, via the telephone or audiocassettes, with computer-generated graphics), videocassettes, and computer conferencing are used as examples to identify factors that should be considered in media selection, including access, costs, student control, teacher control, organization, teacher time, and teaching objectives. The use of the CYCLOPS audiographics system in distance tutorials of the Open University is highlighted. Difficulties in introducing these newer technologies into existing distance education systems are also discussed. Reasons for using the newer media in distance education are offered, including their potential for improving access to and providing variety in learning materials, their instructional strength, and their cost effectiveness. Twelve references are listed. (LMM).

535,601
ED-253 217 Not available NTIS
Scottish Council for Educational Technology, Glasgow.
New Technology in Open Learning. SCET (Scottish Council for Educational Technology) Open Learning Paper: 403,
N. Paine. Dec 84, 12p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper examines various uses of new technologies in open learning, including methods of electronic delivery and computer assisted and managed learning, and contrasts their specific applications in the areas of administration, delivery of materials, production of materials, student support, and presentation of the materials. New technologies for student support are discussed, including videotex and telesoftware, which enables a user to download either text files or computer programs from a central computer to a remote learner. Characteristics of new technology are examined as they relate to the requirements of open learning materials, which should be individualized, self-pacing, and interactive. A summary list of benefits and constraints related to the use of new technologies in open learning is provided. (LMM).

535,602
ED-253 219 Not available NTIS
Johns Hopkins Univ., Baltimore, MD. Center for Social Organization of Schools.
School Uses of Microcomputers: Reports from a National Survey. Issue No. 6.
Nov 84, 13p
For issues 1-5, see ED 233 111, ED 234 109, ED 242 297, and ED 246 886.

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Ways in which teachers organize classrooms when they have more students than microcomputers available to them were investigated as part of the National Survey of School Uses of Microcomputers, which collected data from 1,082 microcomputer-using schools. These schools represent 68% of a nationally representative sample of about 1,600 microcomputer-owning public and non-public elementary and secondary schools with one or more microcomputers for use by teachers or students, that were surveyed between December 1982 and March 1983. Results indicate that: (1) students work at computers individually more often than in pairs or groups, but some form of mutual assistance is more common than strictly solitary activity; (2) social arrangements for using computers are more common at the junior high level; and (3) seatwork is the primary activity of students in a classroom when other students are engaged at the computer. In addition to grade level and subject matter, variables that might influence style of classroom computer use include the number of students in the classroom, the number of computers available, characteristics of the teacher, and characteristics of the schools' students, particularly the computer-using students. This report is the sixth and final in a series based on the national survey. (LMM).

535,603
ED-253 220 Not available NTIS
Merrimack Education Center, Chelmsford, MA.
'A Technical Assistance Report' on Computer Technology Applications. Smithville School District, Smithville, Massachusetts.
Oct 83, 58p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report of the Technical Assistance Study provided to the Smithville Public Schools by the Technology Lighthouse of the Merrimack Education Center offers information for use in planning computer technology applications over a 3-year period. It provides specific guidelines and criteria for planning and development, equipment considerations, software and courseware, training, program activities, and financial implications. Charts indicate 23 implementation steps for an organizational structure of grades K-2, 3-5, 6-8, and 9-12, and costs are projected for the 3-year period from July 1, 1983, to June 30, 1986. Issues addressed include appropriate applications for computers in the school program, the effect of the computer on curriculum, and the priority areas for implementing educational technology on the 3-year timetable. Eight specific recommendations are listed that relate to the hiring of a computer applications coordinator, purchase of a high school minicomputer, continued purchase of microcomputers, training considerations, software selection and exchange, administrative and special applications, a system-wide computer committee, and evaluation and updates. Preliminary planning steps outlined include establishing a planning committee, conducting staff awareness activites, developing educational philosophy and policies, documenting current computer-based activities, identifying resources, conducting awareness for key groups, and establishing priorities. (LMM).

535,604
ED-253 221 Not available NTIS
Social Context of Using Computers in Schools: It's Not Just a Matter of Good Software,
H. J. Becker. Jun 84, 18p
Paper presented at the Workshop on Computer Literacy (Paris, France, June-July 1984). For reports on the national survey cited see ED 233 111, ED 234 109, ED 242 297, ED 246 886, and IR 011 496.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

If computers were used ideally in education, each student would have enough computer time, each computer enough student time, and computer-based activities would be chosen well. The move towards using microcomputers in the schools has less to do with any clear and demonstrable instructional advantage of using them, and more to do with general societal-wide interest in applicability of computers. A national survey on students' use of microcomputers in schools found that, although schools have made major investments in microcomputers, very few students get a substantial exposure and benefit from using computers, and the typical computer-using student gets little more than a cursory experience. Given the way schools must operate to provide instruction to hundreds of students, simply grafting microcomputers onto the school (and even providing the best software and best curriculum available), will not result in extensive or effective use. The organizational problems of using a relatively small number of computers in a school setting require centralized placement, supervision of younger students, knowledgeable and enthusiastic teachers, cooperative planning among teachers with divergent interests and goals, and, in elementary schools, strong involvement of the school principal. (LMM).

535,605
ED-253 222 Not available NTIS
Television and the Humanist,
J. Zigerell. 5 Oct 84, 10p
Paper presented at the Community College Humanities Association Banquet (Kalamazoo, MI, October 5, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The mass media and especially television pose problems for teachers in humanities disciplines traditionally associated with leisure, time for reflection, and the quiet contemplation of the good, true, and beautiful. Although other media have been criticized for their deleterious effects, television most affects humanists in their mission because of its pervasiveness. We humanists must understand television as an educational force and somehow come to terms with it. An article in the August, 1984 Atlantic Monthly by David Marc, entitled 'Understanding Television,' argues that, although television is the most effective purveyor, image, and narrative in American culture, it has failed to become a subject of lively humanistic discourse. Television poses dangers to thought and informed decision-making that humanists must be prepared to address. Much television programming is mere spectacle and can be negatively employed to manipulate, form attitudes, and incite to action. While television has tremendous educational potential, instructional broadcasters sometimes place too much emphasis on entertainment values in their desire to appeal to viewers other than those looking for direct instruction; too much delight can get in the way of the business at hand. Television programming tends to be superficial, not questioning the meaning of life or human experiences. Individuals who daily spend hours passively viewing television are in danger of 'remaining what they are,' rather than living life to the fullest. Four references are listed. (LMM).

535,606
ED-253 223 Not available NTIS
Educational Technology Center, Cambridge, MA.
Use of Information Technologies for Education in Science, Mathematics, and Computers. An Agenda for Research.
Mar 84, 83p
Contract NIE-400-83-0041
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Developed to guide the research of the Educational Technology Center, a consortium based at Harvard Graduate School of Education, this report addresses the use of new information technologies to enrich, extend, and transform current instructional practice in science, mathematics, and computer education. A discussion of the basic elements required for a research framework individually covers the subject matter to be addressed, the pedagogical potentials of computers and related technologies, how various pedagogical styles can be employed to teach the subject matter, identification of the most crucial research topic within this framework, and a research orientation and process for addressing these topics. The following initial topics are then specified and briefly analyzed: (1) science: weight and density, heat and temperature, formulation of hypotheses, manipulating complex systems; (2) mathematics: word problems, fractions and decimals; (3) computers: functional mental models, programming and cognitive transfer, applications programs; (4) new technologies: school applications of existing videodiscs, the development of school-oriented videodisc materials, educational integration of new technologies with television, speech recognition and access to microcomputers, and non-center projects. Feedback to earlier document drafts is included and explained. (LMM).

535,607
ED-253 225 Not available NTIS
City of London Polytechnic (England). Library and Learning Resources Center.
Library Needs of Part-Time Students Preparing for Professional Examinations. Library Research Digest No. 10,
P. Blagden. 1984, 22p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The City of London Polytechnic offers a number of part-time courses leading to qualifications awarded by professional associations and similar examining bodies. The majority of the courses are taught by the departments of accounting and finance, banking and insurance, transport studies, and marketing. There are also courses in biological sciences, civil aviation, marine engineering, maritime studies, and silversmithing and jewellery. A recent conference on library use by part-time students stressed the heterogeneous nature of part-time students and underlined the importance of the library's sensitivity to their information needs. To assess the needs of this group and assist in the provision of appropriate library facilities, questionnaires were distributed to 22 professional associations and similar examining bodies to ascertain their views on the role of the library in courses leading to their examinations. This document reports the responses from 18 (82%) of the associations. Topics covered include reading lists, the importance of course reading, the importance of college library facilities, mention of library facilities in regulations and syllabuses, textbooks, the importance of keeping up-to-date, project work, proficiency in finding information, computerized bibliographic files and databases, and changes in syllabi. The library use questionnaire and a list of the professional associations and other organizations that responded are appended. (THC).

535,608
ED-253 228 Not available NTIS
Alberta Univ., Edmonton.
Multicultural Education Database--A Feasibility Study.
T. C. Montgomerie. May 84, 235p
Prepared by the ADP'84 project team.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This study identified alternatives for the design, implementation, and operation of a national information management system in multicultural education resources and materials and assessed the feasibility of implementing such a database. Sources of information for the study were potential users of the system, experts in information management and library systems, and document researchers. Data were collected by means of questionnaires, telephone and personal interviews, letters to system suppliers asking for system specifications, in-person interviews with and presentations by a number of suppliers and experts, observations of working systems, an in-depth review of the literature, and the development of a prototype system. This three-part report provides information to assist the non-specialist in understanding the role of library systems and the potential application of a computerized information management system; describes the responses of the two major clients of the system, the users and the information providers; and synthesizes the information and makes final recommendations concerning the feasibility of establishing a national database on multicultural and intercultural education. (THC).

535,609
ED-253 235 Not available NTIS
Statistical Analysis of Library School Deans' Publications,
R. Kilpela. 1984, 25p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The purpose of this study was to ascertain the extent to which deans holding office in 1983 in American Library Association (ALA) accredited graduate library education programs fulfilled the expectations of academia and the ALA 'Standards'' requirement with re-

spect to sustained productive scholarship and evidence of aptitude for research through their publications. Citations to deans' publications were obtained by searching 'Library Literature.' All cited publications were examined. This statistical report analyzes the total number of publications by female and male deans both prior to and after assuming office, by deans of schools with and without doctoral programs, and by deans of doctoral schools receiving the 'top' ratings in Herbert S. White's 1981 survey of library education programs. Periodical articles which represent the principal vehicle for the transmission of new information and research, are analyzed with regard to the type of periodicals in which articles were published, their subject content, and the principal types of literature. This last analysis uses a classification analogous to one devised by Ralph A. Beals in 1941 which divided library literature into three principal types: glad tidings, testimony, and research. (Author/THC).

535,610
ED-253 237 Not available NTIS
Kuringai Coll. of Advanced Education, Lindfield (Australia).
Subject Information Resources: A Guide to Information Resources in Selected Subject Areas of the Humanities, the Social Sciences, and Pure and Applied Sciences,
J. Schmidt. 1983, 269p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Intended for use in courses in information resources at Kuring-gai College of Advanced Education, this guide approaches information resources by subject, building on previous information resources courses which concentrated on format. Resources for selected disciplines within the broad subject areas of the humanities, the social sciences, and pure and applied sciences are examined. The disciplines covered--literature, fine arts, law, history, education, chemistry, biological sciences, medicine, and engineering--were selected because they illustrate both different information use patterns and a variety of different types of information resources. The segment for each discipline examines briefly the nature of the subject and the way in which information is generated and communicated in that subject, in order to provide a background and setting for the identification, evaluation, and use of its information resources. Study questions and exercises are included for each section. The guide concentrates on Australian information resources, but also includes material produced in other countries that is relevant to the Australian situation. (Author/THC).

535,611
ED-253 238 Not available NTIS
Supervisory Rotation: Impact on an Academic Library Reference Staff,
B. Perdue, and C. Piotrowski. 1984, 13p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The results of a managerial rotation program in a medium-sized academic library reference department are presented. After meeting certain minimal eligibility requirements, librarians in this department take turns on a 2-year cycle serving as head of the department. This case study is used as a model to assess both the advantages and disadvantages of a supervisory rotation plan, and to examine the impact of this collegial management technique on the staff, library, and patrons. (Author/THC).

535,612
ED-253 239 Not available NTIS
Association of Research Libraries, Washington, DC. Office of Management Studies.
University of North Carolina at Chapel Hill Public Services Study Report. One of a Series of Self-Studies and Research Projects. Final Report.
Nov 84, 47p
Report issued by the Academic Affairs Library.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This final report completes a self-study begun in August 1983 by the University of North Carolina at Chapel Hill Academic Affairs Library to provide an opportunity for staff to lay the groundwork for services within a new facility. Broad areas identified for study were: effectiveness of services to users, coordination of public services throughout the system, organizational changes within the public services division, programmatic and budgetary priorities, and working relationships between the public services division units and units of other divisions. Task Forces worked in the areas of Internal Communication; Organization, Management, and Staffing; Technology and Public Services; and User Needs, Service Performance, and the Promotion of Public Services. During the self-study, which included a survey of 1,100 library users, over 200 draft recommendations were suggested; and 66 final recommendations are included in this report. The report also includes the director's charge and a one-page introduction. Recommendations are arranged according to the following topics: Communication; Committee System in General; Planning and Coordinating Groups; and Specific Departments and Areas--Planning and Coordination, Staffing, Staff Development and Training, Public Service Policies, Referrals, Microcomputers, Copying Equipment, Access to the Collection, and Issues for Further Review and Study. Task Force reports are available separately from the Association of Research Libraries. (THC).

535,613
ED-253 243 Not available NTIS
Joint Committee on the Library (U.S. Congress).
Books in Our Future,
D. J. Boorstin. 1984, 58p ISBN-0-8444-0490-X, S-PRT-98-231
Report of a study conducted under the auspices of the Center for the Book. Photographs may not reproduce.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This study explores the changing role of the book in the future. The report draws on interviews with authors, publishers, booksellers, computer experts, librarians, scientists, educators, and scholars and on the experience of the Library of Congress staff. The first part, 'The Culture of the Book: Today and Tomorrow,' includes sections on: Books in Our Lives; A Nation of Readers; the Twin Menaces: Illiteracy and Aliteracy; Combining Technologies: The Adaptable Book; and Unexplored Opportunities. Part Two, 'A Manifold Program for a Massive Problem,' suggests numerous activities that citizens can undertake to improve reading habits with sections on: Families and Homes, Schools, Libraries, Churches, Civic and Fraternal Organizations, Businesses, Book Publishers and Booksellers, Newspapers and Magazines, Television and Radio, Labor Unions, Colleges and Universities, Cities and Local Communities, the States, and Prisons and Correctional Institutions. A directory of organizations cited in this section is provided. The next two sections in Part II offer suggestions to Congress and the Executive Branch, and the report concludes with a brief review of initiatives undertaken at the Library of Congress. (THC).

535,614
ED-253 248 Not available NTIS
Current Trends in the Developed Countries and Likely Future Developments in Information Science and Policies. Suggestions for Curricula Designers in Developing Countries.
B. V. Teli. 17 Sep 84, 11p LULID5/LIBR-9000
Paper presented at the Annual Conference of the FID/Education and Training Committee (The Hague, Netherlands, September 17-20, 1984). Prepared at Lund University Library.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

In response to technological developments that are bringing about changes in the information field, this paper focuses on factors that should be considered in planning for curriculum changes in library education in the developing nations. The paper comprises information on: (1) the background of the study; (2) the importance of scientific journal literature; (3) precursors for the developing countries, including events in the publications and communications fields; (4) changes in the information profession, including the development of tools for the processing and transfer of information and the use of databases through the applications of modern technology and normative tools; (5) the need for an information policy and the integration of thought about such a policy in library training; (6) hints for educators; and (7) conclusions. A list of references is provided. (THC).

535,615
ED-253 250 Not available NTIS
Other Librarian: A Survey of Undergraduate Library Science Programs and Their Graduates,
K. A. Schmidt. 1983, 22p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This survey was designed to: produce and compare data on the number and composition of undergraduate library science graduates for a specific year (1980) with statistics on master's level graduates; to identify the probable placement opportunities for undergraduate library science students; to define the administrative levels within colleges and universities which such programs enjoy; and to represent the attitudes of undergraduate library science educators on such topics as the role of the undergraduate program in library education and the future of the undergraduate degree. The 1980 American Library Association Standing Committee on Library Education's 'Undergraduate Programs in Library Education (Four-Year Schools)' was used to define the population to be surveyed. Of the 227 surveys mailed, 166 (73.1%) were returned. Twenty-nine schools reported having no appropriate program and seven supplied unusable information, leaving a total of 130 usable responses. An overall review of the responses shows a high degree of commitment to programs which many respondents believe are dying out. Undergraduate programs seem to be producing employable graduates, particularly in the area of school/media librarianship, and there is a feeling among the administrators of these programs that their graduates can be competitive in other areas of librarianship as well. Following an introduction and information on survey methodology, the report contains sections on: degrees and programs; graduates; positions and salaries; and the attitude survey. References and the survey instrument are included. (THC).

535,616
ED-253 252 Not available NTIS
Association of Research Libraries, Washington, DC. Office of Management Studies.
Temple University Public Services Study Report. One of a Series of Self-Studies and Research Projects. Final Report.
Aug 84, 126p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This self-study by Temple University Libraries involved the efforts of 33 library staff members--9 on the study team, and 24 on 4 task forces--over a period of 12 months. Task forces were organized according to four issues: Organization of Public Services, Staffing and Management, Public Service and Technology, and Library Users and Their Changing Needs. The 110 recommendations that resulted make up the major part of this report. The title of the staff member or committee responsible for implementation and a time line are provided for each recommendation as well as the task force that proposed it. The list is divided into eight areas: (1) Organization (including Administrative Positions); (2) Statistics/Surveys; (3) Users' Services (including In-Depth Reference Services); (4) Access to Materials; (5) Technology and Automation (including Online Systems and Document Delivery); (6) Staffing; (7) Communication; and (8) Facilities and Equipment. This final report also includes the director's charge to the study team and a preface and introduction that explain the background and operation of the study. Appendices list persons (positions) responsible for implementing the recommendations together with references to specific recommendations and present the library's Environmental Profile and Descriptive Inventory of Public Services. Task force reports are available separately. (THC).

535,617
ED-253 253 Not available NTIS
User Education and Marketing of Information Services in Brazil,
N. Figueiredo. Sep 84, 14p
Paper presented at the Annual Conference of FID/ET (The Hague, Netherlands, September 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Arguing that marketing appears to be a solid means for creating users' needs for information as well as for attracting potential users to the library, this paper reviews the current literature in Brazil on marketing infor-

mation services and on user education. It also discusses the current status of library education in Brazil. An analysis of the specialized literature in Brazil shows that only a few articles have been published in the last few years dealing with the topic of marketing in libraries. In library education programs, the subject of marketing is being taught in Brazil mostly in specialized short courses; e.g., at the master's level, the topic is introduced as a module in the discipline 'User's Study' in some courses. It is hoped that a new curriculum in library science started in 1984 will cover marketing concepts and strategies at the undergraduate level. Although a review of the literature on education of library users finds that education is taking place mainly in the university libraries, some articles also describe user education in special libraries in the fields of agriculture and medicine. The paper concludes with a brief description of the program being developed by the Central Library of the University of Rio Grande do Sul, which is making an intensive effort to prepare librarians of the university library system for the role of educating users. (THC).

535,618
ED-253 254 Not available NTIS
Introduction to Your College Library: Making It Work for You,
H. S. Davis. 1984, 107p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This document presents the full text of a self-paced library skills workbook which was piloted in fall 1984 in all sections of freshmen English composition courses at Georgia College. The workbook text is divided into four units of instruction: (1) An Introduction to Georgia College's Russell Library; (2) The Divided Card Catalog Revisited and an Introduction to Periodical Indexes; (3) An Introduction to Selected Specialized Indexes and Reference Sources in the Field of Literature; and (4) Extended Practice in the Use of Selected Specialized Indexes and Reference Sources in the Field of Literature. Study of the first two units includes an audiotaped self-guided tour of the college library; the last two units are strictly in written form. Supplementary materials such as audiotape scripts, evaluation instruments, and evaluation results are included in the appendices. The workbook also includes a bibliography of sources covered, with call numbers or location notes. (Author/THC).

535,619
ED-253 255 Not available NTIS
ERIC Clearinghouse on Information Resources, Syracuse, NY.
Economics of Information in Education. ERIC Digest,
M. Farid. Nov 84, 3p
Contract 400-82-0001
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This digest on the economics of information in education argues that the production, organization, analysis, evaluation, and dissemination of information in education constitute major economic activities, with associated costs and benefits. The document comprises sections on: the value of information; information as an 'economic good'; the economic importance of information at the dissemination stage; examples of the types of information needed by students, administrators, policy-makers, and teachers; methods of information delivery and examples of systems oriented toward students, teachers, and administrators; and costs and prices of information delivery systems. A list of references is included. (THC).

535,620
PB85-183127/GAR PC **A03**/MF **A01**
Ohio State Univ., Columbus. Center for Human Resource Research.
Retirement Decisions of Husbands and Wives.
Rept. for 1966-81,
L. B. Shaw, and M. G. Gagen. 28 Sep 84, 32p
DLETA-84-06
Contract DL-82-39-72-21

Using the NLS older men's cohort, this paper found congruent retirement statuses for husbands and wives among couples in which the wives were employed or formerly employed. Among retired couples, the majority had retired within five years of each other. When considering the influences on spouses' retirement separately, the authors found that women who would become eligible for a full pension at a later time were likely to delay their retirement. Husbands' pension eligibility increased wives' retirement, and wives' pension eligibility also increased the likelihood of retirement for husbands before age 62, but had no effect at older ages. Health affected each spouse's own retirement, but cross-effects were generally not significant. When they used a multinomial logit model to examine the factors influencing whether husbands and wives retired together or separately, they found evidence that spouses have a tendency to work or retire together, but that either spouse may retire along when their pension eligibility or health problems have opposing effects.

535,621
PB85-185213/GAR PC **A03**/MF **A01**
General Accounting Office, Washington, DC. National Security and International Affairs Div.
Analysis of the Implementation of DOD's (Department of Defense's) Resources Management Public Affairs Plan.
15 Feb 85, 32p GAO/NSIAD-85-53, B-217511

GAO analyzed activities conducted in support of DOD's Resources Management Public Affairs Plan to determine its extent, and whether DOD personnel violated any laws or regulations in implementing the plan. No system was put in place by DOD to identify all of the activities undertaken as a result of the plan and GAO was therefore unable to determine the full extent of activities and their associated costs. GAO was able to identify certain activities associated with the plan.

535,622
PB85-202828 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Estimating the Effect of a Large Scale Pretest Posttest Social Program.
Final rept.,
C. H. Spiegelman. 1979, 4p
Pub. in American Statistical Association 1979 Proceedings of the Social Statistics Section, p370-373 1979.

It is well known that nonrandomized education programs are difficult to evaluate (Campbell and Stanley (1968)). Some help in the evaluation may be obtained by using available instrumental variables, such as G.R.E. scores, or I.Q. tests. However, they should be used with great care as errors in these variables can mislead naively performed analysis. The work shown here gives a new procedure for evaluating pretest-posttest social programs. This paper summarizes the most important results and procedures found in Spiegelman (1976, 1977). Examples indicating how and when the new procedure may be useful are found at the end of this paper.

535,623
PB85-928103/GAR PC **E09**/MF **A01**
Central Intelligence Agency, Washington, DC.
Appearances of Soviet Leaders, January - December 1984.
Mar 85, 237p CR-85-10145
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB85-928100.

Listing of appearances of selected soviet leaders for the year 1984.

5J. Psychology (Individual and Group Behavior)

535,624
AD-A153 731/5/GAR PC **A16**/MF **A01**
Letterman Army Medical Center, San Francisco, CA.
Proceedings of the AMEDD (Army Medical Dept.) Clinical Psychology Short Course Held at San Francisco, California on 4-8 March 1985.
Final rept.,
N. K. Willcockson. Mar 85, 353p

The Proceedings document the paper presentations/workshops/symposia covering various areas of AMEDD (Army Medical Dept.) clinical psychology to include current professional issues in the field of military psychology, consultation/prevention/education programs, current issues and instruments in psychological assessment, innovation therapeutic techniques, and professional and paraprofessional mental health training.

535,625
AD-A153 937/8/GAR PC **A04**/MF **A01**
Chicago Univ., IL. Center for Decision Research.
Contrast/Surprise Model for Updating Beliefs.
Technical rept.,
H. J. Einhorn, and R. M. Hogarth. Apr 85, 69p Rept no. TR-13
Contract N00014-84-C-0018

Although the updating of beliefs is a central concern in many fields, empirical research has produced complex and conflicting results. We first present a psychological model of updating that assumes equal attention is given to all information. The model is based on an anchoring-and-adjustment process that incorporates a contrast or surprise effect; in particular, the larger the current opinion, the more it is discounted by negative evidence and the less it is increased by positive evidence. The model predicts strong recency effects for conflicting evidence and, no order effects for consistent evidence. These predictions are contrasted with those of alternative models and tested in a series of six experiments involving the evaluation of written scenarios containing varying amounts and types of information. Thereafter, we generalize the model to include the effects of differential attention and show the conditions under which attention decrement can lead to primacy rather than recency. Specifically, under attention decrement, people with strong prior beliefs are more prone to primacy than those with weak priors. We then discuss our theoretical framework and results with respect to procedural variables that can affect judgment, the optimal inattention problem, comparisons with alternative models of updating (e.g., Bayesian models), and limitations and extensions of the present approach. (Author)

535,626
ED-252 173 Not available NTIS
National Education Association, Washington, DC.
Computer and Education. What Research Says to the Teacher,
M. N. Tolman, and R. A. Allred. 1984,34p ISBN-0-8106-1061-2
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The findings of research on computers and teaching are reviewed in this monograph, both to provide useful guidelines for teachers, and to serve as a reference point for further research. Research results are organized around the following topics: (1) computer availability and use; (2) classroom applications--computer assisted instruction, computer managed instruction, testing and recordkeeping, and instructional games; (3) curricular applications--language arts, mathematics, science, and social studies; (4) exceptional children; (5) attitude and motivation; (6) large computer systems--PLATO and TICCIT; and (7) future issues and concerns--the videodisc, software (quality control and software protection), quality of research, relationship with industry, networking, teacher training, and effect on formal education. A concluding statement briefly discusses some advantages of and problems with computer use, and an 85-item bibliography is provided. (LMM).

535,627
ED-252 193 Not available NTIS
Computer Anxiety and Instruction,
R. Baumgarte. 1984, 6p
Paper presented at the Spring Meeting of the Southeastern Psychological Association (30th, Atlanta, GA, March 28-31, 1984).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

While the computer is commonly viewed as a tool for simplifying and enriching lives, many individuals react to this technology with feelings of anxiety, paranoia, and alienation. These reactions may have potentially serious career and educational consequences. Fear of computers reflects a generalized fear of current technology and is most prevalent in already-anxious individuals who are forced to deal with computers, espe-

cially in subordinate roles. External locus of control has also been identified as a predictor of computer anxiety. Teaching strategies relevant to alleviating students' computer anxiety might include the following: explanation of the logistics and functions of computer components; teaching the function of computers by using a set of rules; using several strategies to lower students' frustration levels; having the beginner adopt a computer mentality, in which orderliness, sequencing, and attention to detail are paramount to successful human/computer interactions; and insuring that early assignments incorporate tasks that are relevant to students' educational goals. Seventeen references are listed. (LMM).

5K. Sociology

535,628
AD-A153 621/8/GAR PC **A15/MF A01**
Harmm (E.L.) and Associates, Inc., Virginia Beach, VA.
Productivity Review and Analysis of Directorate of Engineering and Housing , Karlsruhe Military Community, Federal Republic of Germany.
Final rept. 24 Jul-30 Nov 84.
30 Nov 84, 345p
Contract DACA65-84-C-0111

The objectives of this study are to provide a comprehensive review of the Directorate of Engineering and Housing at the U.S. Military Community Karlsruhe including the Engineer Support Division at Germersheim, to make tangible and intangible recommendations that will increase productivity, and to ensure maximum effectiveness of Real Property Maintenance Activity (RPMA) expenditures. Accomplishment of these objectives will assist the Directorate of Engineering and Housing in providing the necessary support to the community and specifically the units attached to Karlsruhe and Germersheim. This support will enhance the mission of the community through an increased state of readiness by keeping the morale of the soldier and his family high and making Karlsruhe a better place to live and work.

535,629
AD-A153 787/7/GAR PC **A06/MF A01**
Oklahoma State Univ., Stillwater. Dept. of Agricultural Economics.
Recreation Benefits Measured by Travel Cost Method for the McClellan-Kerr Arkansas River Navigation System and Application to other Selected Corps Lakes.
Contract rept.,
D. F. Schreiner, D. A. Willett, D. D. Badger, and L. G. Antle. Feb 85, 121p IWR-85-C-1
Contract WRC-IA-81-20

This study was designed with two objectives. First, to estimate what recreational users would be 'willing to pay' through admission fees to use the Corps project; the travel cost method was utilized to estimate the user benefits. Second, the regional estimator model, derived from McClellan-Kerr Arkansas River Navigation System data was applied to several reservoirs outside the study area to test their predictive ability. The analysis used data gathered in a survey conducted during 1974 and 1975. The original purpose of this survey was to develop a data base on recreational expenditure for various activities across the McClellan-Kerr Arkansas River System. That data base (from about 3,000 interviews) remains as one of the richest sources of recreational user information ever gathered.

535,630
AD-A153 821/4/GAR PC **A03/MF A01**
Air Force Human Resources Lab., Brooks AFB, TX.
Youth Population for 1980: A Verification Report.
Interim rept. 4-24 Nov 82,
M. J. Ree, L. D. Valentine, and J. A. Earles. Feb 85, 32p Rept no. AFHRL-TP-84-47

An investigation was conducted to confirm the results of a report written by the Center for Naval Analyses (CNA) on the proposed adoption of the 1980 Youth Population as a new reference for calibration of the Armed Services Vocational Aptitude Battery (ASVAB). Although deviations were noted in the procedures used by the CNA, the report was found to be essentially correct in tis results, Psychometric, policy and organizational issues involved in the selection of the appropriate reference population were examined and implications of a change from the 1944 Mobilization Base to the 1980 Youth Population sample were discussed.

535,631
AD-A153 874/3/GAR PC **A04/MF A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Key Indicators of Recreation Use for 1983: Preliminary Findings.
Final rept.,
M. R. Waring, D. J. Snepenger, J. E. Fletcher, and D. Burns. Feb 85, 65p Rept no. WES/MP/R-85-1
Report on the Natural Resources Research Program.

Recreation areas and campsites at Corps of Engineers water resource project have a variety of natural and man-made attributes from which the camper can select. This study sought to identify, from this larger group of attributes, those which are most often preferred by the user. Preference research usually falls into one of two categories: (a) stated preferences solited through direct questionings, or (b) revealed preferences documented through examination of actual behavior. Both methods were used in this study to serve not only as a validity check, but also to ensure that a full coverage for preference attributes was incorporated into the study. Preference data for campsite and recreation area attributes were obtained from campers at five Coprs of Engineers lakes. Findings across the five lakes indicated that, in general, campers select campsites based on the presence of utilities, lake view, shade, vegetative buffering, distance to lake, back-in and impact pads, and proximity and type of sanitary facilities. Additionally, preferences in recreation areas wer size of the area, type and quantity of the sanitary facilities, number of showers, and presence of utilities at the campsites.

535,632
AD-A153 921/2/GAR PC **A05/MF A01**
Yale Univ., New Haven, CT. School of Organization and Management.
Race Relations Advisory Group: An Intergroup Intervention.
Interim rept.,
C. P. Alderfer, R. C. Tucker, C. J. Alderfer, and L. M. Tucker. Mar 85, 91p Rept nos. SOM-WP-67, ONR-5-TR
Contract N00014-82-K-0715

This report explains the theoretical basis for a race relations advisory group, describes the five year history of such a group, analyzes the developmental phases of the group, and reports systematic data on the behavior and attitudes of members.

535,633
HRP-0906351/2/GAR PC **A05/MF A01**
Utah Health Systems Agency, Salt Lake City.
County Health Demographic Profiles. Utah Health Service Area 1.
1985, 90p
Portions of this document are not fully legible.

This booklet contains descriptive data about each of the 29 counties in Utah and is designed to assist planners in the development of health-related programs and projects necessary to their areas. Data include county population, population projections, live births, infant mortality, fertility rate, teenage fertility rate, population under 18, elderly 65+, number of primary care physicians, unemployment rate, poverty levels, number of nursing home beds and the number of hospital beds.

535,634
HRP-0906368/6/GAR PC **A03/MF A01**
Metropolitan Council/Metropolitan Health Planning Board, St. Paul, MN.
Birth Statistics for Health Planning Areas in the Twin Cities for 1982. Health Service Area 5.
Mar 85, 35p PUB-18-85-007

The purpose of this report is to provide 1982 birth statistics and trend information for use by regional agencies, educators, students, hospitals, clinics and other health-related organizations. On a regional level, birth statistics are useful for health planning to coordinate and avoid duplication of health care services. At a local level, such as the neighborhood level, individual hospitals, clinics and health service agencies use such statistics to identify and effectively meet the needs of clients from particular service areas.

535,635
HRP-0906369/4/GAR PC **A03/MF A01**
Metropolitan Council/Metropolitan Health Planning Board, St. Paul, MN.
Death Statistics for Health Planning Areas in the Twin Cities for 1982. Minnesota Health Service Area 5.
Mar 85, 36p PUB-18-85-008

Death statistics are used as health status indicators and in generating population estimates. As health status indicators, they are used to target high-risk population groups and to develop appropriate and accessible programs and facilities to improve health status and reduce mortality rates. Death statistics are also useful in evaluating the impact of such programs and facilities. In addition, they are useful in monitoring progress toward health status goals as stated in the Metropolitan Area's 'Health Systems Plan' (HSP).

535,636
PB85-182434/GAR PC **E04/MF E04**
Bank of England, London.
Employment, Real Wages and Unemployment in the United Kingdom.
c1984, 34p PANEL PAPER-24, ISBN-0-903312-71-9
Papers presented at the Meeting of the Panel of Academic Consultants (24th) on October 26, 1984.

The paper is concerned with the thesis that in Britain in recent years one principal cause of unemployment has been an excessively high level of real wages, which has 'priced the workers out of jobs'. The statistics of prices, wages, profits and productivity for the UK do not give any substantial support to the idea of a powerful and general force acting to discourage production through higher real wages depressing profitability, as required by the theory of 'unwillingness to supply'. Nor do the figures for after tax return on capital demonstrate that there has been substantial discouragement to investment outside and beyond the effects of low demand and (at times) low international competitiveness. I conclude that the case for the High Wage Induced Unemployment thesis, as a major explanation of mass unemployment in the United Kingdom, has not so far been properly made out either on theoretical or on empirical grounds.

535,637
PB85-183119/GAR PC **A03/MF A01**
Ohio State Univ., Columbus. Center for Human Resource Research.
Health-Pension Interactions in the Analysis of Early Retirement Trends.
Rept. for 1966-81,
T. N. Chirikos, and G. Nestel. 28 Sep 84, 36p
DLETA-CHRR-84-04

This study tests whether there is an underlying interaction between policy inducements and health-related retirement behavior. Inclusion of mortality in the model ensures that selectivity biases are minimized and permits direct testing of several key inferences made in previous studies. Findings are: (1) Work-limiting health conditions are neither permanent nor influenced exclusively by impaired physical or psychological functioning, so studies using these measures as proxies for the capacity to engage in market work are likely to overstate involuntary withdrawals from the labor force. (2) Evidence of interaction effects between policy-related and health-related outcomes provides fundamental support for the hypothesis that inducements arising from social insurance and income transfer programs influence labor market behavior. (3) This analysis provides weak evidence that life expectancy biases the results of early retirement studies that use mortality and a health proxy and pension wealth as indication of policy inducements.

535,638
PB85-185096/GAR PC **A05/MF A01**
Employment and Training Administration, Washington, DC. Unemployment Insurance Service.
Unemployment Insurance Schemes in Developing Countries.
Unemployment insurance occasional paper,
S. A. Wandner, J. G. Robinson, and H. S. Manheimer. 1984, 85p DLETA/UIS-84/2

The purpose of this report is to analyze problems relating to the introduction of unemployment insurance schemes in developing countries. Chapter I of the report consists of a literature review on this topic.

Chapter II presents analyses of the economy and unemployment insurance scheme of developing countries that have implemented unemployment insurance, with emphasis on those countries that submitted national monographs. The economic situation and unemployment protection schemes of selected developing countries without an unemployment insurance scheme are also discussed. Chapter III presents a summary and analysis of economic and demographic characteristics of developing countries with and without unemployment insurance schemes as well as a summary of major unemployment insurance provisions in ten developing countries with unemployment insurance schemes.

535,639
PB85-187235/GAR PC A06/MF A01
Agency for International Development, Washington, DC. Office of Evaluation.
Haiti: HACHO (Haitian-American Community Help Organization) Rural Community Development.
Project impact evaluation rept. no. 49,
D. W. Brinkerhoff, P. T. Fotzo, and B. J. Ormond.
Nov 83, 110p AID-PN-AAL-025

THe Haitian-American Community Help Organization (HACHO), founded in 1966 to provide health and community services in resource-poor Northwest Haiti, received A.I.D. funding from that date through 1979. The vicissitudes and impacts of HACHO-which soon became a focal point for local residents seeking help as well as for donors seeking a vehicle to provide assistance-are herein reviewed. HACHO, which began by providing health services in one small town, soon expanded geographically-into other parts of the Norhtwest-and sectorally-into community organization, road construction, and later, agricultural extension, irrigation, potable water, and handicrafts. The primary impact of thee HACHO project lay in its provision of basic services where none existed before.

535,640
PB85-187672/GAR PC A07/MF A01
Environmental Protection Agency, Washington, DC. Statistical Policy Branch.
Survey Management Handbook. Volume 1. Guidelines for Planning and Managing a Statistical Survey,
C. Croce. Nov 84, 146p EPA/230/12-84/002-VOL-1
See also PB85-187680.Revision of report dated Nov 83.

Volume I focuses on survey design principles and ways program officials might productively apply them in planning a contract survey.

535,641
PB85-187680/GAR PC A08/MF A01
Environmental Protection Agency, Washington, DC. Statistical Policy Branch.
Survey Management Handbook. Volume 2. Overseeing the Technical Progress of a Survey Contract,
C. Croce. Dec 84, 171p EPA/230/12-84/002-VOL-2
See also PB85-187672.

Volume II emphasizes the conduct and management of an Agency-sponsored survey. Each of the six chapters of Volume II corresponds to a major component of a typical work plan for a statistical survey of human populations.

535,642
PB85-190841/GAR PC A06/MF A01
California Univ., Los Angeles. Inst. for Social Science Research.
Factors Affecting the Incidence of Bus Crime in Los Angeles. Volume 1.
Final rept.,
N. Levine, and M. Wachs. Jan 85, 101p UMTA-CA-06-0195-85-1
Grant DOT-UMTA-CA-06-0195
See also PB85-190858.

A survey of 1088 randomly-selected households was conducted to measure the incidence of bus crime in west central Los Angeles, and to assess sources of reporting error and isolate environmental factors contributing to bus crime. A method was illustrated for detecting dangerous bus stop locations and observations at three were conducted. There was strong support among respondents for bus crime prevention, and several suggestions were made. It was recommended that the existing reporting system must be supplemented by police reports using revised crime categories.

535,643
PB85-190858/GAR PC A06/MF A01
California Univ., Los Angeles. Inst. for Social Science Research.
Factors Affecting the Incidence of Bus Crime in Los Angeles. Volume 2. Appendices.
Final rept.,
N. Levine, and M. Wachs. Jan 85, 123p UMTA-CA-06-0195-85-2
Grant DOT-UMTA-CA-06-0195
See also PB85-190841.

A survey of 1088 randomly-selected households was conducted to measure the incidence of bus crime in west central Los Angeles, and to assess sources of reporting error and isolate environmental factors contributing to bus crime. Volume II contains appendices: A - Survey Questionnaire; B - Sample Design, Sampling Error and Probabie Bias; C - Observations at Three Dangerous Bus Stops; D - Some Transit Crime Reporting Systems in Southern California--Towards An Alternative Method.

535,644
PB85-191872/GAR PC A04/MF A01
World Fertility Survey, London (England).
Estimation and Presentation of Sampling Errors.
Technical bulletin no. 11,
V. Verma. Dec 82, 60p AID-PN-AAM-804
Prepared in cooperation with International Statistical Inst., Voorburg (Netherlands).

It is widely recognized that reports of survey results should include estimates of sampling errors. This technical bulletin, one in a series issued by the World Fertility Survey (WFS), provides systematic and detailed guidelines on computing, presenting, interpreting, and using sampling errors. Following a brief introduction, Section 2, directed to the general user of survey results, defines sampling error and explains why it is useful to compute sampling errors; it also provides a simple exposition of the interpretation and use of sampling errors, with examples. Section 3 describes practical methods of computing sampling errors. The context here, as elsewhere, is that of a large single-round survey, such as a WFS survey, with a probability sample and complex design, aimed at producing a variety of descriptive statistics. Section 4 explores patterns of variation in sampling error results in the light of theoretical and empirical considerations, illustrating how information on sampling error may be summarized, and how it can be extrapolated to subclasses, variables, and samples other than those for which actual computations were performed. Finally, Section 5 provides guidelines on presenting sampling error results for different users: general readers; subject matter specialists; and sampling statisticians.

535,645
PB85-192078/GAR PC A05/MF A01
Evaluation Technologies, Inc., Arlington, VA.
El Salvador: A Country Profile.
Jun 82, 77p AID-PN-AAL-122
Contract AID/SOD/PDC-C-0283

Baseline information for the planning and relief operations of the U.S. Office of Foreign Disaster Assistance are presented in this country profile of El Salvador. Brief descriptions are presented of the country's historical, geographical, and infrastructural characteristics, government structures and processes, disaster preparedness organizations and procedures, and population status and trends. Health status, particularly the high prevalence of gastrointestinal diseases and of malnutrition, is reviewed in relation to sanitation, health facilities and personnel, nutrition, water supply, and housing. A description of the economy, a review of trends in domestic production and trade, and an assessment of the current situation is given.

535,646
PB85-194389/GAR PC A15/MF A01
Syracuse Research Corp., NY.
Role of States in Earthquake and Natural Hazard Innovation at the Local Level: A Decision-Making Study,
W. H. Lambright. Dec 84, 338p NSF/CEE-84053
Grant NSF-CEE80-18710

A study undertaken to investigate the process of policy innovation in earthquake preparedness is reported. The process of earthquake policy innovation is considered in three policy settings. South Carolina and Nevada are emergent settings, where there are seismic threats but the level of policy concern is low; activity and innovation reflect this fact. A case of earthquake policymaking in Japan is used to illustrate the dynamics of the process of earthquake innovation in an advanced setting, where the threat is well established and so is the policy framework for coping with that threat. California is discussed as an intermediate policy setting. The origins of the Southern California Earthquake Preparedness Project (SCEPP) are traced, and program implementation is discussed. Reasons for SCEPP's success are suggested, and its future activities are delineated.

535,647
SHR-0012574/GAR PC A06/MF A01
Bokonon Systems, Inc., Washington, DC.
Research on the Societal Consequences of Adolescent Childbearing: Welfare Costs at the Local Level.
Final rept.
Oct 81, 118p
Contract N01-HD-0-2838

This study is an effort to overcome some of the problems of past studies of Aid to Families with Dependent Children (AFDC) recipients and to provide a descriptive micro examination of human services costs obtained at the local level by these families. The study is based on a census of welfare contacts and costs in Monroe County, New York, during 1977 and 1978. County files were examined in order to acquire the data for the study. The data demonstrate the extent to which public assistance payments accrue to women whose first birth was as a teenager and compare them to costs of women who withheld conception until their post-adolescent years. The recipients who gave birth as teenagers constitute a majority of the public assistance population and consume 60 percent of the costs of the county. They had a higher birth rate over time than did those who gave birth at a later age. However, after age 30, those who delayed conception far outnumbered those who became pregnant as teenagers. It is apparent that as the children grow older, the families leave the welfare roles. Thirty tables and 18 references are included.

6.
BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

535,648
AD-A153 456/9 Not available NTIS
Pittsburgh Univ., PA. Dept. of Pharmacology.
Cofactor Modified Electrodes,
L. B. Wingard, Jr. 1984, 5p ARO-18310.8-CH
Contract DAAG29-82-K-0064, Grant NSF-CPE81-07715
Availability: Pub. in Trends in Analytical Chemistry, v3 n9 p235-238 1984 (No copies furnished by DTIC/NTIS).

Studies are underway to see if flavin adenine dinucleotide or nicotinamide adenine dinucleotide cofactors can be attached to electrode surfaces to give rapid rates of electron transfer and in some cases reconstitution of enzyme activity with appropriate apoenzymes. Such electrodes may find widespread application in analytical chemistry.

535,649
AD-A153 566/5 Not available NTIS
State Univ. of New York at Buffalo. Dept. of Chemistry.

Permeation of Ellman's Anion in Catonic Surfactant Vesicles.
Rept. Jan-Jun 85,
R. A. Moss, S. Swarup, and R. P. Schreck. 1985, 5p
ARO-19175.15-CH
Contract DAAG29-82-K-0122
Availability: Pub. in Tetrahedron Letters, v26 n5 p603-606 1985 (No copies furnished by DTIC/NTIS).

The redistribution (permeation) of Ellman's anion (2-nitro-5-thiolatobenzoate) from surface to interior sites of cationic vesicular dihexadecyldimethylammonium bromide is characterized by k apparent = 0.08-1.7/sec. Fluorescence stopped-flow spectroscopy has been employed to study the permeation of (e.g.) 1-anilino-8-napthalenesulfonate (ANS) into liposomes and vesicles. Absorption spectroscopy is much less commonly applied to permeation problems, although Murakami has recently described the dynamics of binding of p-n-hexyloxynitrobenzene to cationic vesicles derived from alanine. In the course of our continuing studies ofthee dithionite cleavage of Ellman's reagent in dihexadecyldimethylammonium bromide (16 subscript 2) veecles, we have observed time-dependent uv spectral behavior of ellman's anion in 16 subscript 2 vesicles. These apparent permeation phenomena are described here and shown to afford kinetic parameters similar to those derived from the ANS fluorescence 1c and dithionite chemical studies.

535,650
AD-A153 832/1/GAR PC **A02/MF A01**
Wisconsin Univ.-Madison. Food Research Inst.
Studies on the Immunochemical Techniques for Detection of Selected Fungal and Dinoflagellate Toxins.
Annual progress rept. 1 Nov 81-31 Jul 82,
F. S. Chu. 15 Aug 82, 19p
Contract DAMD17-82-C-2021

The goal of this contract is to develop a method for the production of antibodies against several selected mycotoxins and dinoflagellate phytotoxins and subsequently to develop a radioimmunoassay (RIA) or an enzyme-linked immunosorbent assay (ELISA) for toxin determination. During the first nine months, effective methods for the preparation of hemisuccinate (HS) and hemiglutarate (HG) of T-2 toxin, HS of diacetoxyscirpenol (DAS), and 0-carboxymethyl oxime (0-CM) of vomitoxin (deoxynivalenol, VT) were developed. Methods for the preparation of reduced saxitoxin (STX) as well as HS of reduced saxitoxin (STXOL) were also established. These derivatives were chemically characterized and were conjugated to bovine serum albumin (BSA) for subsequent immunization. They have also been conjugated to horseradish peroxidase (HRP) for direct enzyme linked immunosorbent assay (ELISA) and to polylysine and hemocyanin for indirect ELISA. The toxicy of T-2 HS (LD50) was determined in mice. For antibody production, 26 rabbits were immunized with various toxin-BSA conjugates.

535,651
AD-A153 881/8/GAR PC **A02/MF A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Effect of Proteases on the beta-Thromboglobulin Radioimmunoassay.
Special rept.,
J. A. Donlon, E. A. Helgeson, and M. A. Donlon.
1985, 7p Rept no. AFRRI-SR85-2
Pub. in Life Sciences, v36 n6 p525-531 1985.

Rat peritoneal mast cells and mast cell granules were evaluated by radioimmunoassay for the presence of Beta-thromboglobulin and platelet factor 4. The initial assays indicated that a Beta-thromboglobulin cross reacting material was released from mast cells by compound 48/80 in a similar dose-dependent manner as histamine release. The material was also found to be associated with purified granules. However, the use of protease inhibitors in the buffers completely abolished the positive assays. Further evaluation of the effects of various proteases on the Beta-thromboglobulin assay indicated that elastase would also generate a false positive assay which could then be neutralized by the use of alpha 1-antitrypain as a protease inhibitor. There was no protease effect on the platelet factor 4 radioimmunoassay which always showed no detectable amounts with mast cells, granules or proteases. These results clearly indicate the artifactual positive assays which can arise when using certain radioimmunoassay tests in the presence of cell proteases. The use of protease inhibitors is a necessary control when applying a radioimmunoassay to a system with potentially active proteases.

535,652
AD-A153 917/0/GAR PC **A02/MF A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
C. Cell Proliferation Kinetics Analyzed with BrdU and Near-UV Light Treatment,
M. P. Hagan. 1984, 19p
Pub. in Bibliotheca Haematologica, n48 p384-402 1984.

Since its discovery by Greer and Zamenhof in 1957, the sensitization to ultraviolet light of cells containing bromodeoxyuridine (BrdU)-substituted DNA has proven to be a powerful tool for the molecular biologist. The protolysis of DNA substituted with BrdU has provided techniques for such diverse applications as mutant selection, gene mapping, and DNA repair 'patch-length' analysis. Also, the increased mass of the BrdU-substituted DNA was formed the basis for studies of semiconservative replicntion and DNA repair replication. A third property of BrdU, its interaction with various fluorescent dyes, has yielded increased sensitivity for the analysis of sister chromatid exchange. The latter technique has also provided considerable information concerning in vitro cell cycle kinetics.

535,653
AD-A153 930/3/GAR PC **A02/MF A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Calcium- and Voltage-Activated Potassium Channels in Human Macrophages,
E. K. Gallin. Dec 84, 5p Rept no. AFRRI-SR85-4
Pub. in Biophysical Jnl., v46 p621-825 Dec 84.

Single calcium-activated potassium channel currents were recorded in intact and excised membrane patches from cultured human macrophages. Channel conductance was 240 pS in symmetrical 145 mM K(+) and 130 pS in 5 mM external K(+). Lower conductance current fluctuations (40% of the larger channels) with the same reversal potential as the higher conductance channels were noted in some patches. Ion substitution experiments indicated that the channel is permeable to potassium and relatively impermeable to sodium. The frequency of channel opening increased with depolarization and intracellular calcium concentration. At .0000001 M, channels activity was evident only at potentials of +40mV or more deplorized while at .00001 M, channels were open at all voltages tested (-40 to +60 mV). In intact patches, channels were seen at depotarized patch potential of +50 mV or greater, indicating that the ionized calcium concentration in the macrophage is probably less than .00001 M.

535,654
AD-A153 936/0/GAR PC **A02/MF A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Isolation of Cellular Membranes from Rat Mast Cells,
L. M. Amende, and M. A. Donlon. 1985, 8p Rept no. AFRRI-SR85-1
Pub. in Biochimica et Biophysica Acta, v812 p713-720 1985.

Large amounts of membranes enriched either in perigranular membranes or in plasma membranes have been successfully isolated from rat peritoneal mast cells. A cycle consisting of a single sonication pulse to disrupt the mast cells followed by centrifugation to separate the released granules was repeated until 90% of the mast cells were disrupted. This technique resulted in a high yield of intact granules since the released granules were only exposed to the single sonication pulse. The intact granules were separated from plasma membrane fragments by centrifugation through a Percoll gradient. The perigranular membranes were then obtained by osmotic lysis of the purified intact granules. The plasma membrane fraction was enriched 4.5-fold (range, 4.1-6.1) in 5'-nucleotidase activity, a plasma membrane marker enzyme. No suitable marker enzyme activity was found for the perigranular membrane fraction. An important aspect of this procedure is its potential for obtaining both a plasma and perigranular membrane preparation in high yield and purity from the same mast cell preparation.

535,655
AD-A153 969/1 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Early Kinetics of Calcium plus Two Cation Fluxes and Histamine Release in Rat Mast Cells Stimulated with Compound 48/80,
D. E. McClain, M. A. Donlon, T. A. Hill, and G. N. Catravas. 1984, 6p Rept no. AFRRI-SR85-10
Availability: Pub. in Agents and Actions, v15 n3/4 p279-284 1984 (No copies furnished by DTIC/NTIS).

The kinetics of Ca(2+) uptake and efflux have been measured in rat peritoneal mast cells stimulated with compound 48/80 using rapid mixing and a silicone oil centrifugation technique. Responses at one-second time intervals were resolved beginning as early as three seconds after initial stimulation. The results clearly demonstrate that Ca(2+) uptake occurs after the initiation of histamine release. Ca(2+) efflux occurs simultaneously with histamine release. The implications of these findings are discussed and the technique is described.

535,656
PB85-191971/GAR PC **A02/MF A01**
Georgia State Univ., Atlanta. Dept. of Biology.
Biodegradation of Jet Fuel by Aquatic Microbial Communities,
J. C. Spain, and C. C. Sommerville. 1985, 22p EPA/600/D-85/084
Grant EPA-R-809370

This paper describes laboratory experiments that studied the fate of jet fuel in several types of situations that could be encountered in the field. Benzene, toluene, and p-xylene were the only components of the fuel that dissolved in the water to significant concentrations. All three compounds volatilized within 24 h and, thus, did not remain in the water long enough for microbial degradation to affect their fate. Inclusion of sediment (500 mg/l dry weight) did not retard the disappearance of the fuel components, and rates of disappearance were identical in controls sterilized with HgCl2.

535,657
PB85-194207/GAR PC **A04/MF A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Enzymatic Transformations of Lignin. Final Report.
Rept. for 1 Jul 79-30 Jun 82,
W. R. Glasser, and P. L. Hall. May 83, 56p NSF/CPE-83035
Grant NSF-CPE79-13135
See also PB84-183383.

To elucidate the structural transformations that lignin undergoes as a consequence of microbiological and enzymatic contact, industrially produced kraft lignin was incubated with Coriolus versicolor in a deep tank fermentor under different fermentation conditions and for different periods of time. Two modes of degradative action were discerned: the primary one is an unspecific oxidation of lignin which requires close physical contact between the solid lignin substrate and the cells, and the other mode of action occurs by means of extracellular enzymes of the phenol oxidase or laccase type. The reactivity of partially biotransformed kraft lignin with alkylene oxides in base catalyzed reactions at elevated temperatures was found to be greater than that of the control sample. White-rot treated lignins were determined to have raw material characteristics superior to unaltered lignin.

6B. Bioengineering

535,658
AD-A153 504/6/GAR PC **A05/MF A01**
Georgia Inst. of Tech., Atlanta. Biomedical Research Div.
Development of an EM-Based Lifeform Detector.
Annual technical rept. no. 3, 1 May 84-31 Jan 85,
J. Seals, S. M. Sharpe, and S. Crowgey. Mar 85, 97p
Contract N00014-82-C-0390

Georgia Tech is currently conducting a successful program to develop an electromagnetically-based lifeform detector capable of detecting vital signs-related information in battlefield casualties from extremely long ranges (10-100 meters). The original program goal was to develop a capability to detect respiratory activity in battlefield casualties from ranges up to 30 meters. However, because of the success of early program efforts, and the Navy's wishes to also detect cardiac ac-

tivity, the program scope was expanded to include detection of respiratory and cardiac activity and the desired detection range was extended to 100 meters. The lifeform detector (LFD) being developed on this program measures and analyzes scattered electromagnetic fields to detect respiratory and cardiac motions associated with the casualty being evaluated. Because antenna-based techniques are being used to perform the required scattered-field measurements, true remote-sensing is achieved. That is, to evaluate a casualty one does not have to wear or carry a biomedical transducer or other type of auxiliary device. This fact greatly enhances the attractiveness and potential usefulness of the LFD.

535,659
AD-A153 796/8/GAR PC **A04**/MF **A01**
Pennsylvania Univ., Philadelphia. Dept. of Bioengineering.
Interactions between Electromagnetic Fields.
Rept. no. 1 (Final), 1 Apr-31 Dec 84,
H. P. Schwan. 10 Feb 85, 73p
Grant N00014-84-G-0045

We applied for this grant to support a workshop at Erice, Italy. This workshop has been commonly called 'Erice School' and the main subject of this workshop is the interaction of electromagnetic fields with biological cells and molecules. The grant from ONR enabled us to invite American scientists to participate in this workshop and deliver scientific papers. The duration of the Erice School was ten days. Therefore, we had sufficient time to discuss the problems of electromagnetic radiations. Vigorous discussions took place during official sessions and during private conversations. The participants of this workshop are mostly those who have been active in the research on bioelectromagnetics, but there are some numbers of speakers who discussed the basic electrical and magnetic properties of polyelectrolytes, biological membranes and tissue. The workshop was unique in that there were participants with a variety of training backgrounds. This enabled us to exchange the information between applied scientists and basic scientists. Also, active exchanges of opinions took place between biological scientists and physical scientists.

535,660
PB85-861615/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Blood Flow Measurement: Ultrasonic Methods and Equipment. 1975-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-Jun 85.
Jun 85, 250p
Supersedes PB84-858323.

This bibliography contains citations concerning the utilization of ultrasonic techniques and equipment for the measurement and imaging of blood flow and blood flow parameters. Topics include laboratory and clinical evaluations of doppler velocimeters, applications in the detection of arterial disease, technology reviews, and theoretical studies. Applications in blood pressure measurement are also considered. (This updated bibliography contains 297 citations, 38 of which are new entries to the previous edition.)

6C. Biology

535,661
AD-A153 605/1/GAR PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Statistics Center.
Towards a Statistical Analysis of Genetic Sequences Data with Particular Reference to Protein Sequences.
Technical rept.,
S. P. Arsenis. Mar 85, 121p Rept no. TR-36-ONR
Contract N00014-74-C-0555

This report develops a variety of character matrices as graphical tools for the visual examination of genetic sequences and in particular protein sequences. The NNC, PNC, BNCI, BNC2, and BNC3 matrices are designed to filter noise without severely suppressing signals in the CC matrix. The Matrix Smear of a character matrix is introduced as a measure of signals and noise in the matrix. The asymptotic distribution of the smears of the CC and NNC matrices are derived under the independence model. The asymptotic result is used in conjunction with exact confidence intervals from diagonal smears to automate partially the visual examination of character matrices. A generalized likelihood ratio procedure is developed to automate fully the detection of signals in two protein sequences. A simulation study has proven the procedure to be powerful and robust in detecting signals of success probability .90 and length 9 implanted within noisy binary strings of length 291 characters and success probability .15.

535,662
AD-A153 735/6/GAR PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Environmentally-Controlled Extended-Use Small Animal Hypobaric Chamber,
J. A. Devine, and A. Cymerman. 21 Mar 85, 18p
Rept no. USARIEM-M-22/85

An environmentally-controlled extended-use small animal hypobaric chamber has been designed to study small laboratory animals at low barometric pressures for long periods of exposure. The rectangular chamber (91.4 x 71.1x 50.8 cm) is constructed of aluminum plate and acrylic resin, with a volume of 32.3 cc3. A computer/data acquisition control unit provides for controlling and collecting data on pressure, temperature and relative humidity (RH) for an indefinite period of time. Altitude simulation is achieved using a two-stage, air-cooled vacuum pump with a displacement of 30 cc3/min. The pressure within the chamber is controlled by an incremental throttling valve in the vacuum line. Temperature (0-100 C) is measured with a platinum thermometer and is accomplished by using a remote-controlled constant temperature circulating bath. RH (20-80%) is measured with a sulfonated polystyrene resistance grid with pre-conditioned air being supplied to the chamber using the purge air ventilation system. Saturation is controlled by modulating air through a moisture condensing tube or a water-jacketed aerator. Drinking water and electrical feed-throughs are passed into the chamber using airtight bulkhead adapters. Combined long-term environmental simulations were conducted at 380 and 522 + or - 2 Torr, temperature at 21 + or - 2 C and RH 50 + or - 5% for 3 weeks.

535,663
AD-A153 770/3/GAR PC **A02**/MF **A01**
School of Aerospace Medicine, Brooks AFB, TX.
Fungal Infections of Ventricuil in Captive Birds.
Final rept.,
G. B. Hubbard, R. E. Schmidt, D. L. Eisenbrandt, W. N. Witt, and K. C. Fletcher. Jan 85, 5p Rept no. USAFSAM-TR-83-352
Pub. in Jnl. of Wildlife Diseases, v21 n1 p25-28 Jan 85.

Ventricular candidasis was the apparent cause of death in 14 of 21 captive birds, and incriminated in six others. No clinical signs were recognized in 14 of 21 birds prior to death, and in four of the 21, no other gross or microscopic lesions were documented. Microscopic lesions included colonization of the koilin layer of the ventriculi by fungi with occasional penetration into the glandular epithelium. No conclusive pattern of infection by family of birds was detected.

535,664
AD-A153 804/0/GAR PC **A02**/MF **A01**
School of Aerospace Medicine, Brooks AFB, TX.
Steady-State Visual Evoked Responses in Anesthetized Monkeys.
Final rept.,
W. R. Klemm, R. A. Goodson, and R. G. Allen. 1984, 7p Rept no. USAFSAM-TR-83-203
Pub. in Brain Research Bullentin, V13 n2 p287-291 1984.

Steady-state visual evoked potential (VEP) responses to counterphased checkerboard stimuli were evaluated in 4 adult male Rhesus monkeys under pentobarbital anesthesia. VEPS were digitized and averaged over 2 sec epochs for 3 consecutive 30 secs during each given stimulus condition; the spectral power in the EEG at the stimulus reversal frequency was computed from the averaged VEP. Large VEPS were reliably produced over the range of 3-6 Hz reversal rat; at the faster reversal rate of 10HZ, the VEP spectral power at 10 HZ diminished in all monkeys, approaching their noise level of activity. Monkeys differed in the amount of variability of spectral power they developed in response to a given stimulus frequency. The topographic distribution of maximum VEP was not uniform; in 3 monkeys the power was much greater over one hemisphere than the other, although all monkeys developed large VEPs at the midline. Within a monkey there were usually no significant differences in VEP over the three-30 sec segments of a given stimulation. Significant differences in power did occur in all monkeys at 2 or more stimulus frequencies across the 3 to 5 replicate sets of stimuli, even though all sets were presented during apparently stable anesthesia during the same experimental session. We conclude that the anesthetized monkey can be a suitable model for study of steady-state VEPs, as long as the proper stimulus parameters are employed and as long as the level of variance in the VEP is taken into account.

535,665
AD-A153 820/6/GAR PC **A02**/MF **A01**
School of Aerospace Medicine, Brooks AFB, TX.
Seminoma and a Leiomyosarcoma in an Albino African Lungfish (Protopterus dolloi).
Final rept.,
G. B. Hubbard, and K. C. Fletcher. Jan 85, 4p Rept no. USAFSAM-TR-84-205
Pub. in Jnl. of Wildlife Diseases, v21 n1 p72-74 Jan 85.

A seminoma and a leiomyosarcoma are described in an albino African lungfish (Protopterus dollio). Approximately 1 wk prior to death, a male, albino African lungfish was noticed to have an obstructive intestinal mass protruding from the anus. Upon dissection, the tumor measured 18 cm by 6 cm diameter, had occluded the intestinal lumen. Histologically, the intestinal mass was composed of uniform, well-vascularized neoplastic mesenchymal tissue that extended from the serosal surface to the lumen of the intestine. The seminiferous tubules of the testicles were packed with an essentially homogeneous well-differentiated population of large, round to polyhedral, hyperchromatic neoplastic cells that resembled germinal epithelium. The interstitium of the kidney contained populations of both invasive neoplastic smooth muscle and testicular cells. It was not possible to determine if the neoplasms in this fish were metastatic. It is probable they were invasive of the kidney, because of the proximity and the fact that invasive growth is common in malignant tumors of fish.

535,666
AD-A153 863/6 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Hexose Regulation of Sodium-Hexose Transport in LLC-PK1 Epithelia: The Nature of the Signal.
Scientific rept.,
A. Moran, R. J. Turner, and J. S. Handler. 1984, 7p Rept no. AFFRI-SR85-11
Availability: Pub. in Jnl. of Membrane Biology, v82 p59-65 1984 (No copies furnished by DTIC/NTIS).

It has been shown previously that the concentration of glucose in the growth medium regulates sodium-coupled hexose transport in epithelia formed by the porcine renal cell line LLC-PK sub 1. Assayed in physiological salt solution, the ratio of the concentration of alpha-methyl glucoside (AMG) accumulated inside the cell at steady state to its concentration outside, and the number of glucose transporters, as measured by phlorizin binding, was inversely related to the glucose concentration in the growth medium. In this study, using a cloned line of LLC-PK sub 1 cells, we provide evidence that the difference in AMG concentrating capacity is the result of a regulatory signal and not simply due to a selection process where the growth of cells with enhanced glucose transport is favored by low glucose medium or vice-versa. By adding glucose to conditioned medium (collected after 48 hr incubation with cells and therefore containing less than 0.1 mM glucose), we demonstrate that the signal in the growth medium is indeed the concentration of glucose rather than another factor secreted into or depleted from the medium. Growth in medium containing AMG does not affect the transporter, indicating that the regulatory signal is not a direct effect of the hexose on its carrier but involves hexose metabolism.

535,667
AD-A153 931/1/GAR PC **A02**/MF **A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Macrophage Colony-Forming Cell,
T. J. MacVittie. 1984, 19p Rept no. AFRRI-SR85-9
Pub. in Biblthca Haematologica, n48 p112-130 1984.

This section will deal with the culture technique, growth characteristics, and properties of the M-

CFC(Macrophage Colony Forming Cell) a CFC distinct in many ways from the more primitive GM(Granulocyte Macrophage)-CFC and HPP(Hematopoietic Progenitor Cells) CFC. There is abundant literature on the growth characteristics and physical properties of the GM-CFC but much less information on the new and interesting HPP-CFC. The ability to clone macrophages in liquid culture has allowed the investigation of macrophage populations cloned from M-CFCs derived from a variety of sources, including peritoneal and pleural exudate, alveolar space, thymus and lymph nodes, and as well as the bone marrow, spleen, and peripheral blood.

535,669
JPRS-CEA-85-013/GAR PC$15.00
Joint Publications Research Service, Arlington, VA.
China Report: Economic Affairs, Table of Contents, JPRS-CEA-84-054, 2 July 1984 - JPRS-CEA-84-107, 26 December 1984.
7 Feb 85, 183p
Trans. of Chinese reports, 1985.
Paper copy also available on Standing Order, Deposit Account required. Order as PB85-941302. Call NTIS Subscription Office for price quote.

This report contains the table of contents of studies evaluating China's economic structure, economic planning, and national policies.

535,669
PB85-180061/GAR PC E06/MF E06
Water Research Centre, Stevenage (England).
Review of the Toxicity of Aluminium in Fresh Water.
Technical rept.,
A. R. Odonnell, G. Mance, and R. Norton. c1984, 28p TR-197

Recent toxicological investigations have implicated aluminum as a potential cause of the decline in fish productivity in catchments experiencing acid run-off. Following requests for information on the toxicity of this element in fresh water, the relevant literature was reviewed with the intention of identifying environmentally safe concentrations of aluminum. The toxicity of aluminum is dependent on the chemical species of the element. Due to its amphoteric nature, the speciation of aluminum in fresh water is extremely complex and is influenced by many environmental factors, of which pH is the most important. Consequently, this metal's toxicity also exhibits a marked variation with pH. Any general patterns in toxicity are further masked by the differential susceptibility of the various freshwater species tested. The literature does not provide enough information to determine limiting concentrations of aluminum likely to affect freshwater fisheries and freshwater life over the whole range of pH. Gaps in the understanding of this topic are highlighted and recommendations made as to the information required to provide a better comprehension of the toxicity of aluminum in fresh water. (Copyright (c) Water Research Center, 1984.)

535,670
PB85-183952/GAR PC A11/MF A01
Washington State Dept. of Game, Ephrata.
Columbia Basin Wildlife/Irrigation Development Study,
J. H. Foster, W. E. Tillett, W. L. Myers, and J. C. Hoag. Dec 84, 241p REC-ERC-83-6
Contract DI-14-06-100-8885
Sponsored by Fish and Wildlife Service, Fort Collins, CO.

This report describes investigations conducted in the Columbia Basin, Washington, to determine the effects of irrigated farming and irrigation project operation on fish and wildlife resources. Field investigations focused on ring-necked pheasants, Canada geese, mallard, redhead, rainbow trout, and yellow perch, although other species are also discussed. Populations, nesting densities, habitat use, cover requirements, and effects of predation and human disturbance on pheasants during four seasons are discussed for six land use types. Seasonal populations, movements, and habitat use of waterfowl are related to three major wetland types. Data analysis also covered waterfowl nesting densities and brood production in relation to common carp, cattle grazing, human disturbance, and several wetland morphological characteristics. The study examines relationships between upland birds and waterfowl and agricultural crops, farming practices, operation and maintenance of irrigation canals and facilities, weather, and wildlife refuge areas. Lakes and streams are classified in Columbia Basin Project Area in relation to connection with irrigation water distribution systems.

535,671
PB85-184414/GAR PC A05/MF A01
Great Smoky Mountains National Park, Gatlinburg, TN. Uplands Field Research Lab.
Techniques for Controlling Wild Hogs in Great Smoky Mountains National Park: Proceedings of a Workshop, November 29-30, 1983.
Research/Resources Management rept.,
J. Tate. Nov 84, 95p NPS/R/RM/SER-72

This document summarizes information resulting from the Workshop on Control Methods for the European Wild Hog, held at Great Smoky Mountains National Park on November 29-30, 1983. Personnel in the park were deeply concerned about the negative effects of this exotic species on the natural ecosystems of the park and initiated this workshop to explore new and expanded control efforts. Representatives from all National Park Service units experiencing hog problems, as well as scientists with past research or management interest in the species, were invited to the workshop. The expertise of the participants covered a variety of disciplines.

535,672
PB85-185494/GAR PC A04/MF A01
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
Bibliography on Daily Food Raion of Fishes,
P. A. Livingston, and B. J. Goiney. Aug 84, 66p NOAA-TM-NMFS-F/NWC-63

Literature relating to the daily nutritional ration of fishes was compiled into a bibliography. A table summarizing the pertinent daily ration data for various fish is included in the report. The bibliography will help define missing data required to parameterize ecosystem models.

535,673
PB85-186187/GAR PC A03/MF A01
Fish and Wildlife Service, Denver, CO. Denver Wildlife Research Center.
Ecology and Management of the Bullfrog,
R. B. Bury, and J. A. Whelan. 1984, 29p RESOURCE PUB-155
Library of Congress catalog card no. 84-600302.

This paper summarizes and critically reviews information on the biology of the bullfrog related to its ecology, present status, culture, and management. Information through 1982 was selected representing the most recent, important biological and economic features of the bullfrog, and includes historic references where such information is pertinent.

535,674
PB85-189710/GAR PC A02/MF A01
Environmental Research Lab.-Duluth, MN.
Overview of Selected Freshwater Aquatic Toxicology Research in the U.S. EPA (Environmental Protection Agency),
D. I. Mount. 1985, 12p EPA/600/D-85/068

EPA research priorities in aquatic toxicology are established by Agency initiatives. Much emphasis is now directed towards shorter, faster toxicity test methods for pre-market registration of new chemicals and on whole effluent tests to be used as NPDES Permits. More attention is expected to be given to incorporating the regulatory strategy to be used with the development of water quality criteria limits.

535,675
PB85-191369/GAR PC A16/MF A01
International Center for Living Aquatic Resources Management, Manila (Philippines).
Theory and Management of Tropical Fisheries,
D. Pauly, and G. I. Murphy. 1982, 360p ICLARM/CONTRIB-105, AID-PN-AAN-495
Proceedings of the ICLARM/CSIRO (International Center for Living Aquatic Resources Management/Commonwealth Scientific and Industrial Research Organization) workshop on the Theory and Management of Tropical Multispecies Stocks held at Cronulla, Australia on January 12-21, 1981. Prepared in cooperation with Commonwealth Scientific and Industrial Research Organization, Cronulla (Australia).

As yet no satisfactory sophisticated technique exists for assessing the effects of harvesting on multispecies tropical fisheries. Since these fisheries are so intense, however, the workshop reported here represented an attempt to develop a set of practical stock assessment techniques as well as to promote understanding of multispecies relationships. Focus is on freshwater, estuarial, and marine fisheries in Southeast Asia, although much of the discussion has worldwide applicability.

535,676
PB85-192003/GAR PC A15/MF A01
International Center for Living Aquatic Resources Management, Manila (Philippines).
Bibliography of Important Tilapias (Pisces: Cichlidae) for Aquaculture,
P. Schoenen. Mar 82, 347p ICLARM/BIB-3, AID-PN-AAM-838
Grant AID/DSAN-G-0178

Tilapias, fish of African origin, are now important in warm water aquaculture and fisheries worldwide, with culture systems ranging from rice field culture in Asia to experimental systems using power station waste heat in Europe. The present volume is the first bibliography dealing comprehensively with cultured tilapias, i.e., species of the former genera Tilapia and Sarotherodon. Included are all available references on eight species of tilapia.

6E. Clinical Medicine

535,677
AD-A153 879/2/GAR PC A02/MF A01
Washington Univ., Seattle. Dept. of Electrical Engineering.
Techniques for Early Characterization of Burn Injuries.
Annual progress rept. 1 Sep 80-15 Mar 81,
M. A. Afromowitz. 15 Mar 81, 11p
Contract DAMD17-80-C-0147

There are at present no objective methods available to medical personnel to quantitatively characterize the depth of burns or to accurately estimate the time required for healing. This information is crucial in the early stages of burn care since it determines whether or not surgical procedures are required. Our research is directed at the development of two non-invasive tools for characterizing burns during the first hours or days following injury. The first device measures the optical reflection properties of the burn and correlates this measure with healing time. The second instrument measures skin blood flow patterns as a function of depth below the surface of the burn using Doppler ultrasound techniques.

535,678
AD-A153 884/2/GAR PC A03/MF A01
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Special Techniques for the Separation of Hemopoietic Cells: Elutriation.
Special rept.,
J. F. Jemionek, and R. L. Monroy. 1984, 30p Rept no. AFRRI-SR85-7
Pub. in. Bibliotheca Haematologica, n48 p12-41 1984.

Several basic methods of cell separation have been developed for the isolation of a purified or enriched cell population from peripheral blood or bone marrow. Counterflow centrifugation-elutriation (CCE; centrifugal elutriation or counter-streaming centrifugation is the cell separation method discussed in this chapter). In this technique, cells are entered into a chamber with a fluid-flow field in opposition to a centrifugal force. Based on cell size and density, the cells either exit the chamber with the fluid flow or remain in suspension within the chamber under the influence of the centrifugal force field. By either increasing the flow rate or decreasing the centrifugal force field, various cell populations can be selectively eluted from the chamber. This chapter discusses the use of CCE in cell separation, along with recent advancements and limitations of the technique.

535,679
AD-A153 934/5 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.

Hematopoietic Colony-Forming Cells from Mice after Wound Trauma,
G. D. Ledney, D. A. Stewart, D. F. Gruber, H. M. Gelston, and E. D. Exum. 1985, 11p Rept no. AFRRI-SR85-8
Availability: Pub. in Jnl. of Surgical Research, v38 p55-65 1985 (No copies furnished by DTIC/NTIS).

The changes produced in the pluripotential and progenitor cell compartments of the hind leg bone marrow and spleen of skin-wounded mice were examined over a 2-week post-trauma period. Pluripotent cells (Colony-forming unit-spleen, CFU-s) were significantly increased in the spleen and slightly reduced in the leg marrow the first week after trauma. Granulocyte macrophage colony-forming cells (GM-CFC) were significantly increased in the spleen throughout the 2-week period and were increased in the leg marrow during the first post-trauma week. Macrophage colony-forming cells (M-CFC) were significantly decreased in the spleen during the 2-week period and were slightly elevated in the leg marrow during that time. The peripheral blood contained significantly increased concentrations of CFU-s and GM-CFC but not M-CFC. Serum of wounded mice supported growth of GM-CFC but not M-CFC. The growth-promoting factor was extractable by CHCl3 treatment. Serum C-reactive protein concentrations were significantly increased for a 5-day period after wound trauma.

535,680
AD-A153 978/2/GAR PC **A04**/MF **A01**
Maryland Univ. at Baltimore. Center for Vaccine Development.
Studies to Control Endemic Typhoid Fever in Chile.
Rept. no. 1 (Annual) 15 Jul-81-31 Dec 82,
M. M. Levine, R. E. Black, C. Lanata, M. L. Clements, and S. Sears. 29 Jan 82, 57p
Contract DAMD17-81-C-1115
See also report dated 30 Jan 83, AD-A153 979.

A multi-faceted program of applied research was undertaken to control endemic typhoid fever in Santiago, Chile. These studies included: (1) A Case/Control study to identify risk factors and incriminate specific vehicles involved in transmission of S. typhi. (2) Prevalence of chronic S. typhi carriers in persons with cholecystitis. (3) Sample serologic and other screening tests to identify chronic S. typhi carriers. (4) A simple, practical, non-surgical treatment for chronic S. typhi carriers. (5) An evaluation of the sensitivity and specificity of diagnosing acute typhoid fever by identifying Vi antigen in urine. (6) A field-trial of Ty2la attenuated S. typhi vaccine.

535,681
AD-A153 979/0/GAR PC **A04**/MF **A01**
Maryland Univ. at Baltimore. Center for Vaccine Development.
Studies to Control Endemic Typhoid Fever in Chile,
Rept. no. 2 (Annual) 1 Jan-31 Dec 82,
M. M. Levine, R. E. Black, C. Lanata, M. L. Clements, and S. Sears. 30 Jan 83, 63p
Contract DAMD17-81-C-1115
See also report dated 29 Jan 82, AD-A153 978.

A multi-faceted program of applied research was undertaken to control endemic typhoid fever in Santiago, Chile. These studies included: (1) A Case/Control study to identify risk factors and incriminate specific vehicles involved in transmission of S. typhi. (2) Prevalence of chronic S. typhi carriers in persons with cholecystitis. (3) Simple serologic and other screening tests to identify chronic S. typhi carriers. (4) A simple, practical, non-surgical treatment for chronic S. typhi carriers. (5) An evaluation of the sensitivity and specificity of diagnosing acute typhoid fever by identifying Vi antigen in urine. (6) A field-trial of Ty21a attenuated S. typhi vaccine. Keywords: Salmonellosis; Immunization; and Epidemiology, and Vi antigen.

535,682
DE85750907/GAR PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France).
Comparison of Performances of Standard Low Energy Collimators and a Medium Energy Collimator Specially Designed for Imaging with (p,2n) I-123.
B. Aubert, R. Pommet, and G. Roux. Jun 84, 4p
CEA-CONF-7308, CONF-840619-1
31. annual meeting of the Society of Nuclear Medicine, Los Angeles, CA, USA, 5 Jun 1984.
U.S. Sales Only.

The use of iodine 123 produced via the Te-124 (p,2n) I-123 reaction is readily available and less expensive than (p,5n) I-123. The use of standard collimators with (p,2n) I-123 results in poor image quality due to a high percentage of photons with energies greater than 159 keV resulting from I-124 contamination. A High Resolution Medium Energy (HR-ME) collimator has been developed to improve image quality and evaluated. LSF were measured at a depth of 20,60 and 100 mm using a source inside a plexiglas phantom, 200 mm high, placed at 100 mm from the collimator and compared to results of Low Energy High Resolution (LE-HR) and a Low Energy General Purpose (LE-GP) collimators. Sources consisted of p,5n and p,2n I-123. The latter used at 10 and 24 h EOB. Septal penetration was estimated by recording the spectrum at 80% window. The results show that FWHM and FWTM of the LE collimators are always smaller than the ME collimator with all sources. The FWHM and FWTM for each collimator increased with (p,5n) I-123 and (p,2n) I-123 10 h and 24 h after EOB, respectively. The ME collimator reduces septal penetration and minimizes the difference between spectra. It gives better results than the LE-HR collimator up to frequency 0.28 cycles/cm for p,5n and up to 0.39 cycles/cm for p,2n I-123. The MTF of the ME collimator are equal to or better than those of the LE-GP collimator at all frequencies. Although the results of the (p,2n) 10h EOB are better than the (p,2n) 24 h EOB the differences are not significant. In conclusion, the ME collimator improves the quality of (p,2n) I-123 for both static and tomographic imaging and it could be used for In-111 imaging. (ERA citation 10:021785)

535,683
DE85750928/GAR PC **A05**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France).
Development and Application of a Dosimetry Reference for High-Energy Neutron Beams.
J. Caumes, A. Ostrowsky, M. Mancaux, K. Steinschaden, and M. Cance. Jun 84, 99p CEA-R-5254
In French.
U.S. Sales Only.

A tissue equivalent calorimeter, made of Shonka A-150 plastic, has been constructed in order to create a primary standard for high energy neutrons and to establish a calibration procedure for ionization chambers used in neutron therapy. After a detailed description of the calorimeter and the associated measuring system, the preliminary tests are presented, in particular, the evolution of the response as a function of accumulated dose. The measurements of the total absorbed dose (n + gamma) by calorimetry in a neutron beam, in order to determine chamber's calibration factors in terms of absorbed dose to A-150 plastic, have been performed at the Neutrontherapy Unit of the Centre Hospitalier Regional d'Orleans (cyclotron of C.N.R.S., p(34) - Be). The uncertainty in the determination of the total absorbed dose to the tissue equivalent material using the new procedure is 3 % lower than that obtained with the usual procedure, derived from an exposure calibration. (ERA citation 10:021786)

535,684
DE85780524/GAR PC **A04**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Rutherford Appleton Laboratory's Mark I Multiwire Proportional Counter Positron Camera.
J. E. Bateman, J. F. Connolly, R. Stephenson, G. J. Tappern, and A. C. Flesher. 1983, 57p RL-83-113
U.S. Sales Only.

A small model of a proposed large aperture positron camera has been developed at Rutherford Appleton Laboratory. Based on Multiwire Proportional Counter technology it uses lead foil cathodes which function simultaneously as converters for the 511 keV gamma rays and readout electrodes for a delay line readout system. The detectors have been built up into a portable imaging system complete with a dedicated computer for data taking, processing and display. A complete hardware system and sufficient software was provided to permit hospital based colleagues to generate useful images easily. A complete description of the system is given with performance figures and some of the images obtained are presented. (Atomindex citation 15:062135)

535,685
HRP-0906114/4/GAR PC **A99**/MF
Bureau of Health Professions, Rockville, MD. Office of Data Analysis and Management.
Bureau of Health Profession's Area Resource File (ARF) System: U.S. and Metropolitan Statistical Area Summaries of Selected Geographic Resources and Trends in Resources.
1984, 2221p
See also HRP-0906111.

The report is one of the 104 separate state reports containing health resources, trends and socio-demographic information for USA, MSA, State and Counties within each state. These reports were prepared for use by state and local planners, Health Systems Agencies, researchers, and others engaged in health planning, analysis, and research. They are a product of the computerized, county-based Area Resource File (ARF), developed and maintained by the Bureau of Health Manpower's (BHPr) Office of Data Analysis and Management. These reports were published in 1984 and supersede the earlier series of reports prepared in 1981.

535,686
HRP-0906115/1/GAR PC /MF **A01**
Bureau of Health Professions, Rockville, MD. Office of Data Analysis and Management.
Bureau of Health Profession's Area Resource File (ARF) System: U.S. and State Summaries of Selected Geographic Resources and Trends in Resources.
1984, 424p
See also HRP-0906111.

The report is one of the 104 separate state reports containing health resources, trends and socio-demographic information for USA, MSA, State and Counties within each state. These reports were prepared for use by state and local planners, Health Systems Agencies, researchers, and others engaged in health planning, analysis, and research. They are a product of the computerized, county-based Area Resource File (ARF), developed and maintained by the Bureau of Health Manpower's (BHPr) Office of Data Analysis and Management. These reports were published in 1984 and supersede the earlier series of reports prepared in 1981.

535,687

see individual report for order number and price
Bureau of Health Professions, Rockville, MD. Office of Data Analysis and Management.
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System.
1984,51 issues
Supersedes HRP-0902487.

The report is one of the 104 separate state reports containing health resources, trends and socio-demographic information for USA, MSA, State and Counties within each state. These reports were prepared for use by state and local planners, Health Systems Agencies, researchers, and others engaged in health planning, analysis, and research. They are a product of the computerized, county-based Area Resource File (ARF), developed and maintained by the Bureau of Health Manpower's (BHPr) Office of Data Analysis and Management. These reports were published in 1984 and supersede the earlier series of reports prepared in 1981. Other individuals documents are also available:

Alabama. 1984, 215p PC A10, MF A01 **HRP-0906116/9/GAR**
Alaska. 1984, 17p PC A02, MF A01 **HRP-0906117/7/GAR**
Arizona. 1984, 56p PC A04, MF A01 **HRP-0906118/5/GAR**
Arkansas. 1984, 239p PC A11, MF A01 **HRP-0906119/3/GAR**
California. 1984, 188p PC A09, MF A01 **HRP-0906120/1/GAR**
Colorado. 1984, 203p PC A10, MF A01 **HRP-0906121/9/GAR**
Connecticut. 1984, 38p PC A03, MF A01 **HRP-0906122/7/GAR**
Delaware. 1984, 23p PC A02, MF A01 **HRP-0906123/5/GAR**
District of Columbia. 1984, 17p PC A02, MF A01 **HRP-0906124/3/GAR**
Florida. 1984, 215p PC A10, MF A01 **HRP-0906125/0/GAR**

Georgia. 1984, 733p PC A99, PC E03 **HRP-0906126/8/GAR**
Hawaii. 1984, 26p PC A03, MF A01 **HRP-0906127/6/GAR**
Idaho. 1984, 146p PC A07, MF A01 **HRP-0906128/4/GAR**
Illinois. 1984, 320p PC A14, MF A01 **HRP-0906129/2/GAR**
Indiana. 1984, 290p PC A13, MF A01 **HRP-0906130/0/GAR**
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South Dakota. 1984, 215p PC A10, MF A01 **HRP-0906157/3/GAR**
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Wyoming. 1984, 83p PC A05, MF A01 **HRP-0906166/4/GAR**

535,688

see individual report for order number and price
Bureau of Health Professions, Rockville, MD. Office of Data Analysis and Management.
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System.
1984,51 issues

The report is one of the 104 separate state reports containing health resources, trends and socio-demographic information for USA, MSA, State and Counties within each state. These reports were prepared for use by state and local planners, Health Systems Agencies, researchers, and others engaged in health planning, analysis, and research. They are a product of the computerized, county-based Area Resource File (ARF), developed and maintained by the Bureau of Health Manpower's (BHPr) Office of Data Analysis and Management. These reports were published in 1984 and supersede the earlier series of reports prepared in 1981. Other individuals documents are also available:

Alabama. 1984, 281p PC A13, MF A01 **HRP-0906167/2/GAR**
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535,689

HRP-0906315/7/GAR PC **A02**/MF **A01**
Michigan Office of Health and Medical Affairs, Lansing.
Hospice: A Comprehensive Care Alternative for the Terminally Ill.
Issues in Health Policy no. 3.
May 83, 25p

The hospice approach, in contrast, requires a significant shift in orientation. It rejects the notion that the care-giver has failed if a 'cure' has proven to be impossible. Success for the provider is defined in terms of the provider's capacity to help the patient come to terms with the prospect of death and to make it possible for the patient to die in relative comfort and tranquility.

535,690

HRP-0906320/7/GAR PC **A03**/MF **A01**
Michigan Office of Health and Medical Affairs, Lansing.
Regional Variation in Hospital Use in Michigan: A Symptom of Unnecessary Hospitalization.
Issues in Health Policy no. 5.
Jan 85, 36p

Michigan's pattern of hospital use shows wide variation from county to county, with several large counties having use rates below 800 days of medical and surgical care per thousand population per year, while other heavily populated counties have use rates in excess of 1200 days. Even after correcting for age, which is widely acknowledged to affect the need for hospital services, the variation in use rates remains very large. The uneven pattern of hospital use in Michigan almost certainly reflects excess use in some high-use areas--which is costly to all who pay for care and dangerous to the patients who are being hospitalized unnecessarily. Yet, other areas within the state are economical in their use of hospital care while still meeting the health needs of their populations. In designing and implementing policies to constrain utilization and control costs, it seems appropriate to recognize these variations in use patterns and to differentiate between those areas which have a consistent pattern of inappropriately high use and those which are already using resources efficiently.

535,691

HRP-0906330/6/GAR PC **A03**/MF **A01**
Bureau of Health Professions, Rockville, MD. Office of Data Analysis and Management.
Projections of Physician Supply in the U.S., March 1985.
Mar 85, 47p ODAM-3-85

This paper presents an overview of the assumptions and describes the methodology used in deriving projections of the probable size and characteristics of physician supply in 1990 and 2000. Reflecting the uncertainty surrounding the future changes in components of the model, a range of estimates is presented for total physician supply by country of medical education. This range is presented in three series--a 'basic' (most likely) with low and high alternatives--which attempt to present a picture of the probable future supply given certain specific, clearly defined assumptions. However, in this paper the projections by specialty and geographic location are derived only from the basic estimate of total MD supply. Development of physician as well as other health professions supply projections is an integral and continuing part of BHPr programs.

535,692

HRP-0906348/8/GAR PC **A03**/MF **A01**
Oregon State Health Planning and Development Agency, Salem.

Oregon Senate Bill 522, 1983 Implementation: Quarterly Progress Report No. 1.
28 Jun 84, 45p

The purpose of this report is to fulfill the requirements of Senate Bill 522, Section 7, by presenting for public information and review, an advisory or model set of criteria for appropriate utilization of various care settings. The report goes beyond the requirements by presenting, as appendix material, a detailed and specific example, following the model criteria, for alcohol problems. During the next quarter, the State Health Planning and Development Agency (SHPDA) will prepare and present detailed and specific examples for drug problems and for mental or nervous conditions. This report also represents the beginning of SHPDA's efforts to provide technical assistance to those insurance companies which may choose to implement all or part of the utilization review option.

535,693
HRP-0906355/3/GAR PC **A11**/MF **A01**
Triton Corp., Washington, DC.
Assessment of Third Party Reimbursement: Performance and Practices of Community Health Centers. Volume 1.
Final rept.,
S. S. Bloom, and T. Henderson. Jun 84, 237p
Contract PHA-HRSA-240-82-0093

Based on the study objectives of: (1) assessing the extent CHCs are maximizing third party reimbursement (TPR); and (2) providing CHCs with 'best practices' for pursuing such reimbursement, an analysis of BHCDA Common Reporting Requirments CHC data and the results of eight site visits to CHCs revealed: (1) There appears to be no 'type' of CHC (size, urban/rural, etc.) that strongly correlates with 'best' or 'worst' TPR performance; (2) Provider turnover has significant negative impact on CHC finances, particularly reimbursement performance; (3) Service mix can have a material positive or adverse impact on TPR, depending on: (1) service volumes; (2) reimbursement policies of payors regarding these service areas; and (3) the patient payor mix of a CHC within each service area; (4) CHCs generally do not attempt to influence their patient mix by payment source; (5) Operational processes for billing and collecting from Medicaid and Medicare generally appear to be effective; self-pay and private insurance procedures were much less effectively implemented; (6) Few, if any, CHCs appeared to view TPR from a strategic perspective and could readily answer, 'How many patients are covered by various payors and what are the full costs, charges, adjustments and collections attributable to each payor.' (7) Sites eligible for the Rural Health Clinic Act's reimbursement program were often aware or not fully cognizant of the program's advantages and disadvantages; (8) There is little direct policy involvement by boards in TPR issues; (9) CHCs would benefit from utilizing a 'self-assessment best practices' checklist (as prepared for this Report).

535,694
HRP-0906370/2/GAR PC **A02**/MF **A01**
Oregon Health Sciences Univ., Portland.
Society Must Decide: Ethics and Health Care Choices in Oregon.
Final rept.
Jan 85, 17p

During 1983 and 1984 Oregon Health Decisions held 300 community meetings throughout the state. At these meetings over 5,000 Oregonians shared their views about ethical problems facing health care. Oregon Health Decisions has shown that Oregon citizens want to see health policy leaders, elected officials, administrators, health care providers and local communities work on creative solutions to problems involving: The autonomy and dignity of individuals; Prevention of disease; Justice in distribution of health care services; Cost control in health care; Fairness in resource allocation and rationing policies.

535,695
HRP-0906373/6/GAR PC **A03**/MF **A01**
Indiana State Board of Health, Indianapolis.
Guidelines for Medical Rehabilitation Facilities and Services (for Indiana).
13 Mar 85, 29p

The following guidelines have been developed to assist in meeting the health care needs of the people of Indiana by seeking to improve the delivery of medical rehabilitation services. It is further intended that this document be used with other appropriate guideline documents whenever necessary. All of the criteria in this document parallel the Review Factors developed in the State Health Planning Act, Indiana Code 16-1, Chapter 3.3, and address at a minimum: availability of care, accessibility of care, quality of care, continuity of care, cost of care, systems integration, acceptability of care, financial viability, and the need for care.

535,696
HRP-0906374/4/GAR PC **A04**/MF **A01**
Vermont State Dept. of Health, Burlington.
Vermont Hospital Utilization, 1983.
Apr 85, 52p

The statewide hospital utilization data system was the basis for the tabulations presented in the Monograph Series. All of Vermont's 16 general acute care hospitals participated in the data system by supplying discharge abstracts or compatible information to the Commission of Professional and Hospital Activities (CPHA) Professional Activities Study (PAS). In order to fully understand the provision of health care by hospitals, it is necessary to establish a population which is served by each hospital. These populations can then be used to calculate rates, market shares, and the effect of adjacent hospitals.

535,697
HRP-0906382/7/GAR PC **A08**/MF **A01**
North Carolina Dept. of Human Resources, Raleigh. State Health Planning and Development Agency.
Communicable Disease Morbidity Statistics, North Carolina, 1982.
1982, 152p

This report contains statistics about the incidence of communicable disease in North Carolina. The data come from communicable disease report cards received from hospitals, physicians, and military bases in North Carolina via local health departments and through interstate reciprocal notification of disease. All death certificates which list a reportable communicable disease as a cause of death are also checked and a report is obtained for any previously unreported case.

535,698
JPRS-USB-85-001/GAR PC **A02**
Joint Publications Research Service, Arlington, VA.
USSR Report: Space Biology and Aerospace Medicine, Tables of Contents, JPRS-USB-84-001, 17 January 1984 - JPRS-USB-84-007, 20 November 1984.
14 Feb 85, 17p
Trans. of Russian reports, 1984.
Paper copy also available on Standing Order, Deposit Account required. Order as PB85-940911. Call NTIS Subscription Office for price quote.

This report contains the titles of articles pertaining to Space Biology and Aerospace Medicine published in USSR journals.

535,699
PB85-180560/GAR PC **A09**/MF **A01**
Pittsburgh Univ., PA.
Computerized Algorithms for Evaluating Prehospital Care.
Final rept. 1975-83,
H. Wolfe, and L. Shuman. Jun 83, 194p DOT-HS-806 596
Grant PHS-HS-02902

This report describes the development and an application of a methodology for evaluating the performance of emergency medical services prehospital personnel in the assessment and treatment of medical emergencies. The evaluation is computerized and permits economical screening of data taken from standardized prehospital response reports to screen out potential problem cases for indepth medical review. The methodology facilitates evaluations of prehospital responses over time for individual practitioners, evaluation of individual service performance, and multi-service (regional) comparative evaluations.

535,700
PB85-188878/GAR PC **A17**/MF **A01**
Engineering-Science, Fairfax, VA.
Environmental Release of Asbestos from Commercial Product Shaping.
Final rept. 1981-84,
D. A. Falgout. Apr 85, 396p EPA/600/2-85/044
Contract EPA-68-03-3040

For the first time, the release of respirable asbestos fibers has been quantified in terms of standard mechanical forces using widely accepted methodology and specified QA/QC procedures. Both fabrication of new products from asbestos containing materials and repair or removal of in-use asbestos containing products contribute to the total environmental exposure to asbestos. There is a need to assess these materials and operations according to the potential severity of their fiber releases. This research consisted of performing several simulated industrial/commercial shaping operations on several asbestos containing products. The rates of fiber release, expressed as fibers per cubic centimeter of air inside an enclosed test chamber per gram of asbestos milled, were measured. The filter samples were analyzed by the transmission electron microscope (TEM) method. Lengths, widths, and type of asbestos were reported for fibers and other asbestos structures. In addition, samples were taken for phase contrast microscopic (PCM) analysis during most of the experiments. The results of these analyses are compared. Research on the release of asbestos/substitutes resulting from commercial product manufacture, use, and disposal is of continuing importance. More information about the quantities and dimensions of fibers released during these activities is required in order to develop effective control methods to help protect the public health.

535,701
PB85-169181 Not available NTIS
National Bureau of Standards, Gaithersburg, MD. Polymer Science and Standards Div.
Smear Layer: Removal and Bonding Considerations.
Final rept.,
R. L. Bowen, J. D. Eick, D. A. Henderson, and D. W. Anderson. 1984, 5p
Prepared in cooperation with Oral Roberts Univ., Tulsa, OK. Sponsored by American Dental Association Health Foundation, Chicago, IL.
Pub. in Operative Dentistry, Supplement 3, p30-34 1984.

A study of cut and abraded dentin surfaces using transmission electron microscopy revealed collagen denaturation to a depth of about one micrometer and loosening of microcracking of the calcified intertubular dentinal structure to a depth of about three micrometers below the surface.

535,702
PB85-191906/GAR PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Opportunities for Control of Dracunculiasis: Report of a Workshop Held at Washington, DC. on June 16-19, 1982.
1983, 74p AID-PN-AAN-685
Prepared in cooperation with World Health Organization, Geneva (Switzerland).

Growing recognition of the widespread human suffering caused in Africa, India, and the Middle East by dracunculiasis (guinea worm disease), a parasitic infection transmitted by drinking contaminated water, led to a June 1982 workshop on dracunculiasis control. A report on the conference is herein presented. After an overview of the disease (eti ology and life cycle, symptoms, treatment, epidemiology, social and economic effects, control measures), recommendations are made for national disease control measures in endemic countries. These include: problem assessment; improved case reporting, strategy planning; pilot projects and training; protecting water sources; in-school and adult health education; and a treatment protocol with emphasis on prevention.

535,703
PB85-192219/GAR PC **A08**
Midwest Research Inst., Kansas City, MO.

Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites.
Final rept.,
C. Cowherd, G. E. Muleski, P. J. Englehart, and D. A. Gillette. Feb 85, 159p EPA/600/8-85/002
Contract EPA-68-03-3116

Emergency response actions at chemical spills and abandoned hazardous waste sites often require rapid assessment of (a) the potential for atmospheric contamination by the chemical or waste compound and (b) the inhalation exposure of people living in the vicinity of a surface contamination site. This manual provides a methodology for rapid assessment of inhalation exposure to reapirable particulate emissions from surface contamination sites. Respirable particulate matter is defined as airborne particles equal to or smaller than 10 micrometers aerodynamic diameter. The methodology consists of a site survey procedure, particulate emission factor equations for wind and mechanical entrainment processes, procedures for mapping atmospheric contaminant concentration distributions by scaling the output of pre-solved computer models of regional atmospheric dispersion, and an equation for calculation of inhalation exposure. In addition to the components of the methodology, this manual discusses critical contaminant and site characteristics, describes assumptions and limitations of the procedures, and presents example applications.

535,704
PB85-192763/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Hyperbaric Oxygen Therapy for Treatment of Crush Injury and Acute Traumatic Peripheral Ischemia.
Health technology assessment rept. no. 15,
B. Lemperle. 1983, 16p NCHSR-84-169
See also PB85-121747.

This paper examines the safety and clinical effectiveness of hyperbaric oxygen therapy as an adjunct to conventional therapy in the treatment of crush injury and acute traumatic ischemia. There appears to be a rational theoretical basis for using hyperbaric oxygen therapy as an adjunctive treatment for crush injury and acute traumatic ischemia that is based on physiological studies demonstrating the effects of hyperbaric oxygen therapy on complex wounds. However, a substantial body of evidence to support its effectiveness in clinical practice is lacking. The complexity and diversity of these problems makes it difficult to establish controlled clinical studies. Consequently, there are no controlled clinical trails in the published literature. Reported serial experiences are also sparse.

535,705
PB85-192771/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Photokymography.
Health technology assessment rept. no. 11,
R. Chow. 1983, 9p NCHSR-84-165
See also PB85-121747.

This assessment focuses on photokymography (PKG). PKG is a noninvasive, fluoroscopic test with image intensification for assessing the epicardial segmental myocardial wall motion. Its diagnostic role for coronary artery disease cannot be documented with certainty, in part due to the paucity of published research and clinical studies with an adequate sample size. Further data from well designed studies will help determine whether this technology has been outmoded by more precise measurements or whether it is a fully acceptable procedure in terms of safety and effectiveness.

535,706
PB85-192789/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
EEG (Electroencephalography) Monitoring during Open Heart Surgery.
Health technology assessment rept. no. 1,
D. Cotter. 1983, 21p NCHSR-84-156
See also PB85-121747.

This assessment will focus on the use of EEG monitoring during open-heart surgery. Authors reporting on open-heart surgery describe similar operative methodologies. All reviewed employed an 8- or 16-channel EEG machine with electrodes placed according to the international 10-20 system and used standard montages. Cardiopulmonary bypass (CPB) was carried through in moderate hypothermia (range = 28 to 32C). A bubble or membrane oxygenator was used along with anesthesia to maintain physiologic and metabolic stability during the surgical procedure.

535,707
PB85-192797/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Apheresis for the Treatment of Goodpasture's Syndrome and Membranous Proliferative Glomerulonephritides.
Health technology assessment rept. nos. 2 and 3,
H. Handelsman. 1983, 14p NCHSR-84-157
See also PB85-121747.

This assessment will focus on apheresis for the treatment of Goodpasture's syndrome and membranous proliferative glomerulonephritides. Although prospective, randomized, controlled trials have not been done, it appears that in GS where the patient is anuric and the renal biopsy suggests irreversible destruction of glomerular architecture, intensive plasma exchange and immunosuppression may only be worthwhile to control lung hemorrhage. In patients who have some degree of renal function on presentation, the results of plasma exchange are good, but the results are related to the severity of clinical and histological parameters. For life-threatening forms of GS, plasma exchange should be considered standard therapy.

535,708
PB85-192805/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Topical Oxygen Therapy in the Treatment of Decubitus Ulcers and Persistent Skin Lesions.
Health technology assessment rept. no. 8,
B. Lemperle. 1983, 18p NCHSR-84-162
See also PB85-121747.

This assessment focuses on topical oxygen therapy in the treatment of decubitus ulcers and persistent skin lesions. The use of topical oxygen in the treatment of pressure sores (decubitus ulcers) and other skin lesions does not appear to be a widely known practice among members of the medical community. The effectiveness of topical oxygen under slightly elevated pressure in the treatment of decubitus ulcers and other skin lesions has not been tested rigorously in controlled clinical trials. The studies reviewed do not provide evidence to support the rationale that the oxygen milieu heals by its bacteriostatic effect on wound bacteria or by stimulating fibroblastic activity to produce wound healing. There appears to be some information to support the notion that wounds unresponsive to prior conventional therapy heal following topical oxygen therapy. However, because there are a number of uncontrolled variables in these studies, it is difficult to attribute healing of these wounds solely to application of topical oxygen.

535,709
PB85-192813/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Cardiokymography.
Health technology assessment rept. no. 12,
R. Chow. 1983, 18p NCHSR-84-166
See also PB85-121747.

This assessment focuses on cardiokymography (CKG). CKG is a noninvasive diagnostic test for detecting or excluding coronary artery disease. The purpose of this assessment is to ascertain the value of CKG evaluation of segmental myocardial wall motion, in relation to other more traditional procedures, to identify its limitations and state the conditions under which displacement cardiography should be used. The contents of the report are organized so there is an initial description of the CKG technology, rationale, the advantages, technical limitations, discussion, conclusion, and summary.

535,710
PB85-195238/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Health Technology Assessment Reports, 1983. Number 7. Plasma Perfusion of Charcoal Filters for Treatment of Pruritis of Cholestatic Liver Disease,
D. Cotter. 1983, 11p NCHSR-84-161
See also PB85-121762.

This assessment will focus on plasma perfusion of charcoal filters for treatment of pruritis of cholestatic liver disease. Plasma perfusion of charcoal filters for treatment of pruritis of cholestatic liver disease appears to be a treatment infrequently performed and only when the patient is unresponsive to more conventional therapy. The evidence presented in the literature is based on serial experience involving small numbers where the patients acted as their own controls and appears to demonstrate the relief of symptoms. However, one cannot rule out a placebo effect. Medical professional organizations support the use of this technology as a treatment for pruritis of cholestatic liver disease unresponsive to conventional therapy. However, there appears to be no agreement regarding the number of perfusions over a given period of time.

535,711
PB85-195246/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Health Technology Assessment Reports, 1983. Number 6. Closed-Loop Blood Glucose Control Device,
J. Broida. 1983, 24p NCHSR-84-160
See also PB85-121762.

This assessment will focus on a closed-loop blood glucose control device (CBGCD). The CBGCD is a hospital bedside device designed for short-term management of patients with insulin-dependent diabetes mellitus (Type I). The device has been referred to as an artificial endocrine pancreas or artificial beta-cell that temporarily infuses insulin for a dysfunctional pancreas. It consists of a rapid on-line glucose analyzer, a computer with a controller for the calculation and control of the infusion of either insulin or dextrose, and a multichannel infusion system. In addition, it contains a printer designed to record glucose values on almost a minute-to-minute basis and to provide cumulative totals of the substances infused.

535,712
PB85-195253/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Health Technology Assessment Reports, 1983. Number 5. Anti-Gastroesophageal Reflux Implantation,
D. Holland. 1983, 10p NCHSR-84-159
See also PB85-121762.

This assessment will focus on anti-gastroesophageal reflux implantation. Surgical correction of hiatal hernia has always been a controversial subject. Not only are there numerous surgical techniques in use (i.e., no 'best' technique) but there is no consensus on indications for surgery. The symptoms can be relieved with medical management in the majority of patients (i.e., elevate head of bed, use liquid antacids, avoid cigarettes and alcoholic beverages). More resistant cases may require specific therapy like Urecholin or Cimetidine. For patients with symptoms resistant to medical management, there are several accepted surgical procedures. The procedures include: (a) the Hill procedure of posterior gastropexy, and (b) the Belsey and Missen procedures of fundoplication. Another procedure, the AARP, is a horseshoe-shaped device made of a silicone elastomer shell filled with a highly crosslinked silicone gel.

535,713
PB85-195261/GAR PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Health Technology Assessment Reports, 1983. Number 4. Electroversion Therapy for the Treatment of Alcoholism,
R. Chow. 1983, 8p NCHSR-84-158
See also PB85-121762.

This assessment will focus on electroversion therapy for the treatment of alcoholism. Alcoholism aversion therapy is a method of behavior modification which has been used for the treatment of alcoholism for over 40 years. Two types of aversion therapy are commonly available to the treating physician: chemical aversion therapy and electrical aversion therapy (also known as electroversion therapy and faradic therapy). Electroversion therapy is separate and distinct from electroconvulsive therapy (ECT). The former is an approach to behavior modification achieved through the use of a nine-volt battery connected to electrodes placed on noncentral parts of the body where they can cause slight discomfort when stimulated. The latter is a form of treatment for serious psychiatric syndromes accom-

plished through the use of electrodes which deliver a charge of 70 - 130 volts to cause a seizure. Results from some studies of electroversion therapy suggest that there may be some merit to its use.

6F. Environmental Biology

535,714

AD-A153 775/2/GAR PC **A03**/MF **A01**
Air Force Occupational and Environmental Health Lab., Brooks AFB, TX.
Herbicide Orange Site Treatment and Environmental Monitoring: Summary Report and Recommendations for Naval Construction Battalion Center, Gulfport, Mississippi.
Final rept.,
A. L. Young, C. E. Thalken, and W. J. Cairney. Nov 79, 48p Rept no. OEHL-TR-79-169

Environmental surveys of the soils, plants and the aquatic system in and around a 12-acre Herbicide Orange storage area at Gulfport MS were conducted from 1970 through 1979. The major objectives of the surveys were to (1) determine the magnitude of Herbicide Orange contamination on the storage area; (2) determine the fate of the phenoxy herbicides 2,4-D and 2,4,5-T, their phenolic degradation products and TCDD in soils of the storage area; (3) monitor movements of residues from the storage area into adjacent water, sediments and biological organisms; and (4) recommend managerial techniques for minimizing the impact of the herbicides and TCDD residues on the ecology and human populations adjacent or near the storage area. High levels of TCDD (e.g., 100-200 parts per billion (ppb) were associated with spill sites on the herbicides storage area. The primary recommendation is that the 12-acre Herbicide Orange storage can be left undisturbed permitting the continuation of natural degradation of the herbicides and TCDD.

535,715

DE85010099/GAR PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Pacific Northwest Laboratory Annual Report for 1984 to the DOE Office of Energy Research. Part 2. Ecological Sciences.
C. M. Novich. Feb 85, 59p PNL-5500-Pt.2
Contract AC06-76RL01830
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

Research progress is reported in the following areas: (1) the terrestrial ecology of semi-arid sites; (2) marine sciences; (3) radionuclide fate and effects; (4) waste mobilization, fate and effects; and (5) theoretical research on environmental sampling. (ERA citation 10:022734)

535,716

PB85-179810/GAR PC **E03**/MF **E03**
Norges Tekniske Hoegskole, Trondheim. Electronics Research Lab.
Adverse Health Effects Caused by Community Noise,
T. Gjestland. Oct 84, 24p
Also pub. as Norges Tekniske Hoegskole, Trondheim. Selskapet for Industriell og Teknisk Forskning rept. no. STF44-A84069.

The report gives a review of literature on adverse health effects caused by exposure to normal community noise. The review has yielded no evidence that even long-term exposure to normal community noise may cause any direct negative health effects. However, there is neither any proof that community noise is completely harmless to the health of the exposed individuals. The use of cost-benefit models in the community planning process is discouraged. Instead cost-effectiveness models are recommended.

535,717

PB85-181931/GAR PC **E06**/MF **E06**
Agricultural Research Council, Oxford (England). Weed Research Organization.
Feasibility Study of the Use of Chemicals for Rural Amenity Areas.
Technical rept.,
E. J. P. Marshall. Sep 83, 98p ARC/WRO/TR-71, ISBN-0-7084-0288-7

Amenity land in Britain amounts to over 1.5 million ha, including 847,000 ha of 'amenity grassland' which can be defined as that having 'recreational, functional or aesthetic value, and of which agricultural productivity is not the primary aim'. Chemicals have proved to be effective and labour- and cost-saving in agriculture, horticulture and forestry and might be further exploited in amenity situations. Herbicides are already used for controlling vegetation in some amenity sites, notably around planted trees and for total control on paths, parking areas and around buildings. A feasibility study of the use of chemicals for rural amenity area management has been carried out at the Weed Research Organization sponsored by the Countryside Commission. The objectives have been to find chemicals which reduce sward height (and hence mowing), which selectively control coarse grasses leaving finer species and which encourage short-growing common flowers.

535,718

PB85-193019 Not available NTIS
Georgia State Univ., Atlanta.
Dietary Accumulation of PCBs from a Contaminated Sediment Source by a Demersal Fish ('Leiostomus xanthurus').
Journal article,
N. I. Rubinstein, W. T. Gilliam, and N. R. Gregory. c1984, 14p EPA/600/J-84/267
See also AD-A149 415.
Pub. in Aquatic Toxicology 5, p331-342 Nov 84.

Accumulation and dietary transfer of PCBs from contaminated harbor sediments were studied in a laboratory food chain. Results demonstrate that contaminated sediments serve as a source of PCBs for uptake and trophic transfer in marine systems. Fish exposed to PCB-contaminated sediments and fed a daily diet of polychaetes from contaminated sediment accumulated more than twice the PCB whole-body residues than fish exposed to the same sediment but fed uncontaminated polychaetes. Following 20 days of feeding, the dietary contribution of PCBs accounted for 53% of the total body burden measured in fish, and this percentage appeared to be increasing.

535,719

PB85-862191/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Toxicity of Zinc. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 335p
Supersedes PB84-869593.

This bibliography contains citations concerning health effects related to the uptake and toxicity of zinc. The emissions of trace elements of zinc in the atmosphere, the sources of these emissions, monitoring techniques, and accumulation in the environment are considered. (This updated bibliography contains 355 citations, 26 of which are new entries to the previous edition.)

6H. Food

535,720

DE85780152/GAR PC **A05**/MF **A01**
Instituut voor Toepassing van Atoomenergie in de Landbouw, Wageningen (Netherlands).
Research Institute ITAL. Association EURATOM ITAL. Annual Report 1982.
1983, 81p INIS-mf-9089
U.S. Sales Only.

The Research Institute ITAL is one of the institutes of the Division for Agricultural Research of the Dutch Ministry of Agriculture and Fisheries. For certain aspects of its programme it is also a partner in the Association EURATOM-ITAL with the Commission of the European Community. This annual report deals with: molecular genetic methods for plant breeding; biotechnical production of valuable compounds by means of (plant) cell cultures and microorganisms; soil biology including the rhizosphere; radioactive contamination of the environment and its public health risks; the synergistic interaction between radiation and other mutagenic agents; a new approach in malaria control by means of radiation genetic research on insects; genetic sexing in the Mediterranean fruitfly, Ceratitis capitata; food irradiation (activities within the contract of the Dutch Government with the IAEA in Vienna and the FAO in Rome on food irradiation technology for developing countries). (Atomindex citation 15:062361)

535,721

PB85-187946/GAR PC **A02**/MF **A01**
Florida Sea Grant Coll., Gainesville.
Florida Seafood Regulations and Regulators,
W. S. Otwell. Feb 85, 21p SGR-72
Grant NA80AA-D-00038

This article is intended to explain the pertinent regulations and responsible regulatory authorities which have some monitoring role for the seafood industry in Florida. The primary concerns are proper use of the respective natural resources, product quality and safety, and fair trade practice. These concerns involve a multiplicity of rules and regulators which can have overlapping jurisdiction, conflicting guidelines and inconsistencies. Most seafood firms are often confused, frustrated and prone to criticize the regulatory system. Hopefully, this information can provide a better understanding and appreciation of the difficult regulatory task, and encourage more industry cooperation and compliance.

535,722

PB85-192110/GAR PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Workshop on Single-Cell Protein Held at Jakarta, Indonesia on February 1-5, 1983. Summary Report.
Feb 83, 71p AID-PN-AAN-774
Contract AID-497-79-100-23

To combat serious protein deficiencies among its people, the Indonesian government plans to establish a rural pilot plant to produce single-cell protein from root crops, primarily cassava, as a supplement for both animal and human food. Results of a February 1983 workshop at which Indonesian and U.S. scientists, engineers, economists, and administrators reviewed the proposed project are herein summarized.

535,723

PB85-860856/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Food Bottling Lines and Plants. 1976-September 1983 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1976-Sep 83.
Jun 85, 218p
Prepared in cooperation with International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning control and operation techniques of food bottling lines and design of food bottling equipment. Beverages, liquid, and solid food bottling are discussed. Noise abatement, waste treatment, microbiological and mechanical hazards, environmental protection, and regulations are considered. (This updated bibliography contains 349 citations, none of which are new entries to the previous edition.)

535,724

PB85-860864/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Food Bottling Lines and Plants. October 1983-May 1985 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Oct 83-May 85.
Jun 85, 62p
Supersedes PB83-871814. Prepared in cooperation with International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning control and operation techniques of food bottling lines and design of food bottling equipment. Beverages, liquid, and solid food bottling are discussed. Noise abatement, waste treatment, microbiological and mechanical hazards, environmental protection, and regulations are considered. (This updated bibliography contains

95 citations, all of which are new entries to the previous edition.)

535,725
PB85-861631/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
GRAS(Generally Recognized as Safe) Food Ingredients. July 1979-June 1985 (Citations from the NTIS Data Base).
Rept. for Jul 79-Jun 85.
Jun 85, 89p
Supersedes PB83-806026.

This bibliography contains citations concerning chemical, biological, and biochemical data pertaining to the safety of a variety of food ingredients and flavorings. Specifications and safety data, and literature reviews regarding the toxicity, use levels, and metabolism of specific substances are included. The majority of the research is sponsored by the Federal Drug Administration and performed by the Select Committee of GRAS Substances. (This updated bibliography contains 109 citations, 27 of which are new entries to the previous edition.)

535,726
PB85-861896/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Sorbitol, Mannitol, and Xylitol in Foods. 1972-June 1985 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Jun 85.
Jun 85, 200p
Supersedes PB84-871896. Prepared in cooperation with International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the use of sorbitol, mannitol, and xylitol as artificial sweeteners in foods, beverages, and food products. Concerns of possible mutagenicity, toxicity, teratogenicity, carcinogenicity, and general safety are considered. The measurement and analysis of sweetness, and the nutritional value of these products are discussed. Various problems of dietetic food and beverage users are also reviewed. (This updated bibliography contains 309 citations, 11 of which are new entries to the previous edition.)

535,727
PB85-861979/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Coffee: Organoleptic Properties. 1972-June 1985 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Jun 85.
Jun 85, 144p
Supersedes PB83-863316. Prepared in cooperation with International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the food processing techniques and methods which influence the flavor and aroma of coffee. The effects of drying and roasting of coffee beans, packaging and storage, and brewing techniques are considered. Criteria for sensory evaluation are considered. (This updated bibliography contains 209 citations, 118 of which are new entries to the previous edition.)

6J. Industrial (Occupational) Medicine

535,728
PB85-184109/GAR PC **A02/MF A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report HETA 82-226-1433, Roper Eastern Products, Baltimore, Maryland,
M. T. Donohue, and F. A. Lewis. Apr 84, 23p HETA-82-226-1433

In April 1982 the National Institute for Occupational Safety and Health (NIOSH) received a request to evaluate reported cases of dizziness, nausea, skin rash and hair loss in workers at Roper Eastern Products, Baltimore, Maryland. NIOSH investigators conducted a preliminary walk-through survey during the we.ik of July 19, 1982 and a follow-up environmental/medical survey during the week of October 26. The final industrial hygiene survey was conducted on November 26 and 27, 1982. Based on air sampling results, it is possible that workers in the packing/cardboard box assembly line area are overexposed to carbon monoxide. On the basis of the interview data obtained in this investigation, NIOSH determined that although the levels of exposure on the day of the environmental evaluation were below the evaluation criteria, the employees reported symptoms consistent with the known effects of process substances used in the plant. Considering the benzene and chromium compounds are carcinogens, exposures should be maintained at the lowest level feasible. Recommendations to help alleviate the reported problems are found in Section VIII of this report.

535,729
PB85-184117/GAR PC **A03/MF A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report HETA 82-107-1444, Torrington Company, Torrington, Connecticut,
S. Cohen, and J. Sparer. May 84, 31p HETA-82-107-1444
Prepared in cooperation with Yale Univ., New Haven, CT.

In January 1982, the National Institute for Occupational Safety and Health (NIOSH) received a request to evaluate high reported incidence of dermatitis among employees in grinding operations at the Torrington Co., Torrington, Connecticut, a metal rod and pin manufacturing facility. In January, May, and September 1982, investigators from the Yale University Occupational Medical Program, under contract to NIOSH conducted medical and industrial hygiene evaluations at this facility. Based on the results of this evaluation, NIOSH determined that an occupational health hazard of dermatitis from exposure to coolant fluids used in grinding operations existed at the Torrington Co. Recommendations to help alleviate this problem are included in Section VIII of this report.

535,730
PB85-184133/GAR PC **A03/MF A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report HETA 81-119-1454, James River Power Plant, City Utilities, Springfield, Missouri,
J. N. Zey, and T. C. Aw. Apr 84, 43p HETA-82-119-1454

In February 1982, the National Institute for Occupational Safety and Health (NIOSH) received a request from the Safety Department of City Utilities, Springfield, Missouri, for a health hazard evaluation at the James River Power Plant. NIOSH conducted a preliminary walk-through in March 1982 and a combined environmental/medical follow-up survey on July 20-27, 1982. Based on the results of these evaluations, NIOSH has determined that a potential health hazard did exist, since the noise levels exceeded NIOSH and ACGIH criteria. In addition, the potential for heat stress exposure existed in some plant locations. The results of the medical survey did not indicate significant respiratory problems related to duration of employment in the power plant. Recommendations to improve personal protective equipment and to reduce occupational exposures are contained in Section VIII of this report.

535,731
PB85-184396/GAR PC **A12/MF A01**
Office of Radiation Programs, Washington, DC.
Occupational Exposure to Ionizing Radiation in the United States: A Comprehensive Review for the Year 1980 and a Summary of Trends for the Years 1960-1985,
S. Kumazawa, D. R. Nelson, and A. C. B. Richardson. Sep 84, 252p EPA/520/1-84/005
See also PB81-172421.

The number of workers exposed to ionizing radiation has increased significantly since Federal radiation protection guidance for occupational exposure was first issued in 1960. This report is the second of its kind; it provides a comprehensive review of exposure of workers for the year 1980 and a summary overview of trends for the period 1960-1985.

535,732
PB85-862159/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Welding: Personnel Safety. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 155p
Supersedes PB84-867159.

This bibliography contains citations concerning the health and occupational safety hazards that welding personnel are exposed to. Federal regulations and standards, health hazard evaluation reports, systems and techniques for monitoring welding hazards, research on materials that require special handling, and OSHA recommendations and policies are among the topics discussed. (This updated bibliography contains 174 citations, 17 of which are new entries to the previous edition.)

6K. Life Support

535,733
PB85-187169/GAR PC **A03/MF A01**
Population Reference Bureau, Inc., Washington, DC.
Knowledge and Use of Contraception in Twenty Developing Countries.
Reports on the world fertility survey no. 3,
M. Mamiouk. Feb 82, 48p AID-PN-AAK-983
Contract AID/DSPE-C-0024

Patterns of contraceptive knowledge and use among women in 20 countries in North and South America, Africa, and Asia, as measured in the World Fertility Survey (WFS), are examined in this report. The report begins with a description of WFS data collection techniques and the various contraceptive methods to be studied, including both modern (i.e., the pill, IUD) and traditional methods (i.e., rhythm method, abstinence). Next, the survey results are presented. Patterns of contraceptive use are then analyzed in terms of select background variables such as age of exposed women, number of living children, level of education, place of residence, and employment status.

6L. Medical and Hospital Equipment

535,734
PB85-862118/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Nuclear Magnetic Resonance: Applications in Medical Diagnosis. 1977-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1977-Jun 85.
Jun 85, 186p
Supersedes PB84-867563.

This bibliography contains citations concerning the principles and diagnostic potential of nuclear magnetic resonance (NMR) imaging. Spin-lattice and spin-spin proton relaxation times in normal and diseased tissues are discussed. NMR of nuclei other than protons are also examined. Safety aspects are considered. (This updated bibliography contains 228 citations, 89 of which are new entries to the previous edition.)

6M. Microbiology:

535,735
AD-A153 452/8/GAR PC **A02/MF A01**
Walter Reed Army Inst. of Research, Washington, DC.

Immunoenzymatic Analysis by Monoclonal Antibodies of Bacterial Lipopolysaccharides after Transfer to Nitrocellulose,
H. Sidberry, B. Kaufman, D. C. Wright, and J. Sadoff. Feb 85, 6p
Pub. in Jnl. of Immunological Methods, v76 p299-305 1985.

A rapid, sensitive immunoenzymatic technique for the analysis of lipopolysaccharide (LPS) from gram-negative bacteria using monoclonal antibodies is described. After separation by sodium dodecyl sulfate-polyacrylamide gel electrophoresis, the LPS was either strained with silver or electrophoretically transferred to nitrocellulose. After reaction with anti-LPS monoclonal antibodies, the transferred antigens were visualized by reaction with alkaline-phosphatase-labelled anti-mouse antibodies and a substrate containing naphthol phosphoric acid and Fast Red.

535,736
AD-A153 549/1/GAR PC **A02/MF A01**
Rhode Island Univ., Kingston. Dept. of Chemistry.
Basic Study to Assess the Potential Usefulness of Resonance Raman Spectroscopy as a Means of Rapidly Detecting and Identifying Bacteria and other Microorganisms.
Final rept. 1 Oct 83-31 Dec 84,
W. H. Nelson. 15 Feb 85, 15p ARO-20545.1-LS
Contract DAAG29-83-K-0136

This past year we have explored the potential uses of Resonance Raman and Fluorescence Lifetime Spectroscopies in the rapid characterization of bacteria. Previously we have shown that chromobacteria can be distinguished on the basis of distinctive resonance Raman spectra. Spectra are excited by low power argon ion laser radiation at 488 nm and are due to the presence of carotenoid pigments. While carotenoid pigments in bacteria generally are not useful for identification purposes, the study of chromobacteria has allowed us to assess the potential sensitivity of resonance Raman spectroscopy in this application. We were able to laser illuminate and count two types of bacteria under a microscope. Because it was possible to see the laser excited bacteria while the resonance Raman spectra were being obtained, it was possible to estimate closely the number of bacteria producing a given spectrum. Such high sensitivity suggests but does not prove that spectra are 'surface enhanced'. It is clear that the resonance Raman technique can be highly sensitive and our experiments suggest that remote detection and detection from mixtures is possible in principle.

535,737
AD-A153 560/8/GAR PC **A02/MF A01**
Armed Forces Research Inst. of Medical Sciences, APO San Francisco 96346.
Antimicrobial Susceptibility and Characterization of Outer Membrane Proteins of Haemophilus Ducreyi Isolated in Thailand,
D. N. Taylor, P. Echeverria, S. Hanchalay, C. Pitarangsi, and L. Slootmans. Mar 85, 5p
Pub. in Jnl. of Clinical Microbiology, v21 n3 p442-444 Mar 85.

One hundred strains of Haemophilus ducreyi isolated in Thailand from patients with chancriod were tested by the agar dilution method against 10 antimicrobial agents and typed by outer membrane protein pattern by using sodium dodecyl sulfate gel electrophoresis. All strains produced beta-lactamase and were resistant to tetracycline, kanamycin, and sulfonamides. Most had decreased susceptibility to trimethoprim (MIC for 50% of the strains (MIC50, 0.5 micrograms/ml) and chloramphenicol (MIC50, 8 micrograms/ml). Strains were susceptible to ciprofloxacin (MIC90,0.001 micrograms/ml), ceftriaxone (MIC50, 0.0015 micrograms), erythromycin (MIC50, 0.0015 micrograms.ml), rosoxacin (MIC50,0.03 micrograms/ml), and spectinomycin (MIC50, 8 micrograms/ml). The degree of antimicrobial resistance found in Thailand is higher than that reported for H. ducreyi isolated in other regions. Five different outer membrane protein patterns were found by analyzing proteins in the range of 29 to 61 kilodaltons, but 98% of the Thai strains fell into three patterns which did not differ greatly. Outer membrane protein patterns of Thai strains were also seen in strains from other geographic areas. A new outer membrane protein type was found among nine strains isolated in Singapore.

535,738
AD-A153 574/9/GAR PC **A02/MF A01**
Pennsylvania State Univ., University Park.
Survival of Microorganisms and Bacterial Predation in Nature.
Final rept. 1 Feb 82-28 Feb 85,
L. E. Casida. 28 Feb 85, 7p ARO-18755.9-LS
Contract DAAG29-82-K-0055

Microscopia, plating, and bacteriophage analysis techniques were developed for following bacterial survival and bacterial predation in situ in soil. Several new predators were discovered, and their host ranges were studied. The dorminant predators were identified. A new form of competition involving growth initiation factors was discovered.

535,739
AD-A153 641/6/GAR PC **A02/MF A01**
Reticuloendothelia Society.
Summary of Presentations at Plenary Sessions and Discussion Workshop of the National Meeting of the Reticuloendothelian Society (21st) Held at Montreal, Canada on 14-17 October 1984.
Final rept.
Oct 84, 6p
Grant N00014-84-G-0190

The meeting was initiated by a discussion workshop on Cellular and Molecular Biology of Gamma Interferon. The next presentation was about the genetic engineering of mouse and human gamma interferon, and cloning of the genes for human lymphotoxin and tumor necrosis factor. The next presentation was on the relationship between mouse interferon and macrophage activating factor. The final presentation pertained to the interacellular effects induced by mouse gamma interferon. The first plenary session of the meeting was on Cell-Cell Interaction: A Basic Host Recognition System. The second plenary session was on Recent Advances in Neutrophil Biology. The last plenary session in the meeting on Human macrophages and Disease.

535,740
AD-A153 644/0/GAR PC **A02/MF A01**
Defence Research Establishment Suffield, Ralston (Alberta).
Rapid Rate-Kinetic Turbidometric Assay for Quantitation of Antiviral Complement-Fixing Antibodies.
Memorandum rept.,
R. E. Fulton, and V. L. DiNinno. Feb 85, 25p Rept no. DRES-1141

A rapid rate-kinetic turbidometric assay for the quantitation of viral complement fixing antibodies has been developed, using adenovirus as a model. The procedure is based on the turbidometric quantitation of intact sheep erythrocytes and measures the rate of hemolysis (change in absorbance per min at 640 nm) at maximum velocity occurring in the presence of residual complement not fixed by the antigen-antibody reaction. Reagents were standardized and assays performed using a microprocessor-controlled spectrophotometer with thermoregulated cell compartment and kinetic assay capability. Eleven sera were assayed for complement fixing antibodies both by the conventional microtiter technique and by the rapid turbidometric described here. Good correlation ($r = 0.88$) between the two procedures was obtained. Unlike the conventional complement fixation test, in the rate-kinetic turbidometric complement fixation test, it was found that variation in complement and antigen concentration could be tolerated, end-pointers titers were objectively quantitated, and results could be obtained within one hour. The technique may be adaptable to large-scale automation.

535,741
AD-A153 831/3/GAR PC **A06/MF A01**
Yale Univ., New Haven, CT. School of Medicine.
World Reference Center for Arboviruses.
Annual rept. 1 Jan 81-31 Dec 81,
R. E. Shope. Jan 82, 121p
Contract DAMD17-81-C-1121

Four new phleboviruses were characterized and revisions of the genus Phlebovirus and the family Rhabdoviridae were made. A major effort was made to identify 26 new viruses from Brazil. One of these was from a fatal case of hepatitis, others from birds, wild animals, and mosquitoes and sandflies. The Army-developed Junin vaccine virus was authenticated. Other viruses from ticks, bats, mosquitoes, persons, and mosquitoes from 15 countries were identified. Serological evidence of LCM virus was found in Australian rodents. Technical development of the ELISA for Rift Valley Fever virus and of monoclonal antibodies for the same virus was undertaken. Monoclonal antibodies to Rift Valley fever indicated the existence of at least 2 and probably more epitopes on the virion surface. Monoclonal antibodies to California group viruses showed existence of type specific, subtype specific, and complex specific antibodies. Orbiviruses were found to produce a persistent infection in the Dermacentor variabilis tick cell line. An important technical advance in the Crimean-Congo hemorrhagic fever virus HI test, the use of formalin fixed lyophilized goose cells increased the antigen titer and now permits the technique to be done under primative conditions. A collection was established of low passage yellow fever and chikungunya strains for use of investigators throughout the world.

535,742
AD-A153 862/8 Not available NTIS
California Univ., Berkeley. Naval Biosciences Lab.
Western Equine Encephalomyelitis Virus: In Vivo Infection and Morphogenesis in Mosquito Mesenteronal Epithelial Cells,
E. J. Houk, L. D. Kramer, J. L. Hardy, and R. E. Chiles. 1985, 16p
Availability: Pub. in Virus Research, v2 p123-138 1985 (No copies furnished by DTIC/NTIS).

The infection and morphogenetic events associated with replication of Western equine encephalomyelitis (WEE) virus within the mesenterons of Aedes dorsalis and three strains of Culex tarsalis are compared and contrasted. WEE virus apparently penetrates mesenteronal epithelial cells in vivo through membrane fusion. Profiles of apparent membrane fusion events were observed between virus particles and the microvillar surface of the mesenteron and naked nucleocapsids are observed intracellularly along the apical margin of the mesenteronal epithelial cell within 3 h of ingestion of the bloodmeal. Further, no viral particles were found in association with endocytotic nor lysosomal vacuoles during the initial phases of infection.

535,743
PB85-189785/GAR PC **E04/MF E04**
Electricity Council Research Centre, Capenhurst (England).
Destruction of Pyrogens in Water by the UV/Ozone Technique,
R. Barker, and F. M. Taylor. Aug 84, 37p ECRC/M-1847

Pyrogens are breakdown products from bacteria (alive or dead) which must be removed from any aqueous solution to which the human blood stream is exposed. All presently used techniques for producing pyrogen-free water are based on the separation of these large molecules from the much smaller water molecules. In contrast, the UV/Ozone technique deactivates the pyrogens by a powerful process of oxidation, which chemically breaks up the pyrogen molecules to smaller inactive ones. This technique can reduce the pyrogen concentration in water to the limit of detection (0.1 micrograms/ml).

6N. Personnel Selection and Maintenance (Medical)

535,744
AD-A153 734/9/GAR PC **A02/MF A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Heat Injury: Prevention is the Key,
L. E. Armstrong, and R. W. Hubbard. 2 Apr 85, 22p Rept no. USARIEM-M-25/85

This article deals with the two longest problems facing runners today: dehydration and elevated rectal temperature. Varieties of heat injuries are described and responsibility for prevention of heat injury is discussed. The effectiveness of showers and fine-mist sprays in cooling runners is disputed. Race directors can postpone or cancel races and, thus, have at their disposal the most effective means of stopping heat injury. Runners, too, must take precautionary measures during hot weather running and should reduce running pace if the signs of heat illness are present.

535,745

AD-A153 914/7/GAR PC **A03/MF A01**
Army Medical Research and Development Command, Fort Detrick, MD.
Relationship between the Army Two Mile Run Test and Maximal Oxygen Uptake.
Technical rept.,
R. P. Mello, M. M. Murphy, and J. A. Vogel. Dec 84, 32p USARIEM-T-3/85

Forty-four male (aged 20-51) and seventeen female (aged 20-37) subjects of various fitness and activity levels were evaluated on a two mile run for time and on a treadmill for maximal oxygen consumption. The coefficient of correlation between the treadmill maximal test and the two mile run test for all subjects was -0.91. Separate regression analyses for male and female data also displayed significant correlations (rm = -0.91, rf = -0.89). Stepwise multiple regression analysis of such anthropometric variables as age, height, weight, and % body fat demonstrated that, individually, none of these parameters significantly improved the predictability of both the male and female equations. However, inclusion of body weight in the male equation did improve the predictive accuracy (SEE = 3.31 to 2.69). The high degree of correlation demonstrated between VO2 max and two mile run time thus permits the estimation of either component with significant accuracy from the direct measurement of the other. This study confirms the usefulness and validity of the Army's 2 mile run for time test to indicate the level of aerobic fitness capacity when the test is properly supervised and the subjects are well-motivated.

6O. Pharmacology

535,746

AD-A153 518/6/GAR PC **A02/MF A01**
Walter Reed Army Inst. of Research, Washington, DC.
Stability Study of HI-6 Dichloride in Various Anticholinergic Formulations.
N. D. Brown, R. R. Gray, M. G. Stermer-Cox, B. P. Doctor, and I. Hagedorn. 1984, 7p
Pub. in Jnl. of Chromatography, v315 p389-394 1984.

In this study, we describe a series of experiments which will show that a stable HI-6 antidotal preparation with an extended shelf-life is possible when proper pH and temperature parameters are used.

535,747

AD-A153 563/2/GAR PC **A02/MF A01**
Walter Reed Army Inst. of Research, Washington, DC.
Opioids and Neuropeptides: Mechanisms in Circulatory Shock.
E. W. Bernton, J. B. Long, and J. W. Holaday. 3 Apr 84, 10p
Pub. in Symposium Mediator Mechanisms in Shock, p290-299, 3 Apr 84.

Endogenous opoid systems are activated in stressful situations such as circulatory shock. The opiate antagonist nalaxone improves cardiovascular function in several models of shock caused by endotoxemia, hydovolemia, anaphylaxis, and spinal trauma. The ergotropic neuropeptide, thyrotropin-releasing hormone, in supraphysiology doses, also improves cardiovascular function in these shock models, but this effect does not result from action has been partially characterized. A variety of neuropeptides, including the opoids, seem capable of modulating autonomic function through their CNS actions. In addition, they may play a role in peripheral integration and transmission of autonomic nervous activity by actions at the ganglia and/or nerve endings. Some neuropeptides also have direct autocoid effects in cells, including those of the microvasculature. This raises new questions concerning possible peripheral functions of neuropeptides during circulatory shock, and the nature of their interactions with other potential shock mediators such as monokines and arachidonic acid derivatives.

535,748

AD-A153 780/2/GAR PC **A02/MF A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Effect of Spironolactone on Acute Mountain Sickness.
R. F. Larsen, P. B. Rock, C. S. Fulco, B. Edelman, and A. J. Young. 11 Apr 85, 17p Rept no. USARIEM-M-26/85

This study examined the effectiveness of Spironolactone as a prophylactic agent for the prevention of Acute Mountain Sickness (AMS). Spironolactone 25mg PO QID or placebo was administered to 9 subjects in a double-blind placebo controlled cross over design. Medication was given for 48h prior to and during a 46h exposure to 427 torr (4570m) in a hypobaric chamber. Six subjects demonstrated prevention of either the cerebral or respiratory symptoms of AMS during at least 1 segment of the altitude sojourn.

535,749

AD-A153 882/6 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Plasma Histamine and Hemodynamic Responses Following Administration of Nalbuphine and Morphine.
Scientific rept.,
S. M. Muldoon, M. A. Donlon, R. Todd, E. A. Helgeson, and W. Freas. 1984, 6p Rept no. AFRRI-SR85-12
Availability: Pub. in Agents and Actions, v15 n3/4 p229-234 1984 (No copies furnished by DTIC/NTIS).

A comparative study of plasma histamine levels following administration or morphine and nalbuphine in pentobarbital anesthetized dogs was performed. Two concentrations, 3 mg/kg and 0.3 mg/kg of these drugs were investigated. High dose morphine caused an immediate marked increase in plasma histamine from 5.0 + or - 0.4 to 340 + or - 72 ng/ml. Simultaneous with this increase in plasma histamine was a marked decrease in mean arterial blood pressure within the first minute. In contrast significant alterations in plasma histamine levels were not observed with high or low doses of nalbuphine. A low dose of morphine (0.3 mg/kg) did not increase plasma histamine levels. Heart rase was not changed by any drug treatment. The use of compound 48/80 a specific mast cell degranulating agent allowed for the identification of a specific pool of mast cells capable of responding to morphine. In vitro exposure of purified dog leukocytes to high doses of morphine did not result in histamine release. These results indicate that nalbuphine does not increase plasma histamine, while morphine does, and that the source of the increase in plasma histamine is from tissue mast cells.

535,750

AD-A153 883/4 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Actions of Ethanol on Voltage-Sensitive Sodium Channels: Effects on Neurotoxin-Stimulated Sodium Uptake in Synaptosomes.
Special rept.,
M. J. Mullin, and W. A. Hunt. 1985, 7p Rept no. AFRRI-SR85-13
Availability: Pub. in the Jnl. of Pharmacology and Experimental Therapeutics, v232 n2 p413-419 1985 (No copies furnished by DTIC/NTIS).

Exposure of rat brain synaptosomes to ethanol in vitro reduced the neurotoxin-stimulated uptake of 22Na(+). This effect of ethanol was concentration-dependent, occurred with concentrations of ethanol achieved in vivo and was fully reversible. The inhibitory effect of ethanol on neurotoxin-stimulated sodium uptake was due to a decrease in the maximal effect of the neurotoxins. Ethanol reduced the rate of batrachotoxin-stimulated sodium uptake when measured at 3, 5 and 7 but not 10 or 20 sec after the addition 22Na(+). In a series of aliphatic alcohols, there was a good correlation between potency for inhibition of batrachotoxin-stimulated 22Na(+) uptake and the membrane/buffer partition coefficient, suggesting that a hydrophobic site in the membrane was involved in the action of the alcohols. Ethanol did not affect the scorpin venom-induced enhancement of batrachotoxin-stimulated sodium uptake. The inhibitory potency of tetrodotoxin was also unaffected by ethanol. These results demonstrate that ethanol has an inhibitory effect on neurotoxin-stimulated sodium influx occurring in voltage-sensitive sodium channels of brain tissue.

535,751

PB85-188928/GAR PC **A02/MF A01**
University of Southern California, Los Angeles.
Drug Prescribing and Evaluations by Pharmacists in a Skilled Nursing Facility. Project Summary.
Final rept. 1 Feb 80-31 Jan 83,
J. F. Thompson. 1 Nov 84, 15p NCHSR-85-78
Grant PHS-HS-03898

Clinical pharmacists, under the supervision of a family practitioner physician, assumed responsibility for drug management of geriatric patients in a Los Angeles skilled nursing facility. In a quasi-experimental, pretest-post test control group design, outcome criteria were measured. Compared with the control group which received traditional patient care, the prescribing clinical pharmacists' group had a significantly lower number of deaths, a significantly higher number of patients being discharged to lower levels of care and a significantly lower average number of drugs per patient. The practice of having clinical pharmacists prescribe drug therapy and render general care, under the supervision of a physician, has the potential for saving the health care system approximately $70,000 per year per 100 skilled nursing facility beds.

535,752

PB85-195683/GAR PC **E05/MF E01**
Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center.
Tc-99m Imaging Agents: Production and Quality Control,
J. Weininger, and J. Trumper. Jan 84, 78p IA-1399

A wide range of pharmaceuticals for labeling with Tc-99m, developed by the Soreq Radiopharmaceuticals Department, is described. Details of the production and quality control of 13 kits are given, as well as the range of results required for consistently high quality imaging agents.

535,753

PB85-861060/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Cosmetics: Chemical and Biological Analysis. 1978-1983 (Citations from the Life Sciences Collection Data Base).
Rept. for 1978-1983.
Jun 85, 148p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the chemical, pharmacological, and toxicological properties of such cosmetics as soaps, perfumes, hair sprays, hair dyes, skin creams and deodorants. The carcinogenicity, hypersensitivity, microbial studies, anti-bacterial studies, fragrance compositions, and formulation determinants of cosmetic ingredients are described. Chemical and biological methods of analyses are also considered. (This updated bibliography contains 214 citations, none of which are new entries to the previous edition.)

535,754

PB85-861078/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Cosmetics: Chemical and Biological Analysis. 1984-May 1985 (Citations from the Life Sciences Collection Data Base).
Rept. for 1984-May 85.
Jun 85, 105p
Supersedes PB84-855386. Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the chemical, pharmacological, and toxicological properties of such cosmetics as soaps, perfumes, hair sprays, hair dyes, skin creams and deodorants. The carcinogenicity, hypersensitivity, microbial studies, anti-bacterial studies, fragrance compositions, and formulation determinants of cosmetic ingredients are described. Chemical and biological methods of analyses are also considered. (This updated bibliography contains 149 citations, all of which are new entries to the previous edition.)

6P. Physiology

535,755
AD-A153 751/3/GAR PC **A04/MF A01**
Michigan State Univ., East Lansing. Dept. of Biomechanics.
Position and Mobility of the Shoulder, Spinal Column and Pelvis in Seated Subjects.
Final rept. Mar 82-Sep 83,
H. M. Reynolds, S. C. Leung, and V. Kincaid. Feb 85, 66p AFAMRL-TR-84-060
Contract F33615-82-K-0516

This report describes the results and data formats for a study to investigate three-dimensional internal kinematics of the human shoulder complex, individual vertebrae and the pelvis in unembalmed cadavers by means of stereoradiography. The motion is measured by tracking three-dimensional displacements of multiple radio opaque targets imbedded in the clavicle, scapula, sternum, humerus, a number of vertebrae, and the pelvis. The motion is produced by repositioning the cadavers to produce various degrees of spinal flexion and extension approximating different seated positions. To produce motion in the shoulder complex, the upper arm was moved in adduction and abduction. Sufficient targets were tracked on each of the motion segments to describe six-degree-of-freedom motion for each. In this study, data were collected on three cadavers and analyzed to provide descriptions of motion by position, vectors of targets imbedded with respect to anatomical landmarks and screw axis parameters both expressed with respect to an external fixed reference system and to the adjacent motion segment. A detailed description is provided of the data formats used in generating a magnetic tape, containing the analyzed experimental data, for the Air Force Aerospace Medical Research Laboratory.

535,756
AD-A153 844/6/GAR PC **A03/MF A01**
Harvard Univ., Cambridge, MA.
Program for Study of Skeletal Muscle Catabolism Following Physical Trauma.
Annual summary rept. Aug 81-Sep 82,
D. W. Wilmore. 1 Sep 82, 34p
Contract DAMD17-81-C-1201

To determine if the ketonemia following injury contributed to the increased glucogenesis associated with this catabolic disorder, glucose production and arterial substrates were measured before and after infusion of Na-DL-Beta-hydroxybutyrate (beta-OHB, 20 Mol/kg.minute) in fed, fasted, and fasted-infected sheep. Following three hours of beta-OHB infusion in the awake, conditioned animals, -OHB and acetoacetate blood concentrations more than doubled. With infusion, blood glucose and alanine concentrations decreased in the fed and fasted sheep but not in the fasted-infected group. Glucose production fell significantly. Glucose production was unaffected by beta-OHB infusion in the fasted-infected animals. The accelerated rate of glucose production in sheep following infection is not a consequence of the hypoketonemic state associated with sepsis. To determine the effect of the endorphine system on post-traumatic/septic metabolic responses, Naloxone (2 mg, I.V.) was administered to four sheep, before and after infection. In these normotensive animals, no major alteration in substrate concentration was noted. The endorphine system does not appear to exert major metabolic regulatory effects in this model.

6Q. Protective Equipment

535,757
PB85-862092/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Protective Clothing: Arctic and Tropical Environments. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 121p
Supersedes PB83-804732.

This bibliography contains citations concerning clothing for environmental protection in extreme climates. Topics include especially developed fabrics and textiles, insulating methods, physiological and psychological responses by users, mobility and dexterity of wearers, care of specialized clothing, and human factors involved. (This updated bibliography contains 145 citations, 18 of which are new entries to the previous edition.)

6R. Radiobiology

535,758
AD-A153 854/5/GAR PC **A02/MF A01**
University of Western Ontario, London. Dept. of Biochemistry.
Tissue Culture and in Vivo Modelling of Corneal Opacification and Ocular Injuries Induced by Millimeter Waves.
Annual summary rept. Jun 81-May 82,
J. R. Trevithick. Jun 82, 15p
Contract DAMD17-82-C-2018, Grant DAMD17-80-G-9480

The eventual aims of these experiments are to use intact corneas incubated in vitro and corneas of rats in vivo to high energy pulsed millimeter waves to study the development of corneal damage. Such experiments are expected to establish conditions for corneal damage and to elucidate the mechanisms by which the damage occurs. If intact corneal explants are cultured in tissue culture dishes in medium 35.5 C continuing outgrowth of the epithelial cells occurs from the edge of the explants during a period of at least two weeks. Exposure for shorter periods of such cultured corneas to elevated temperatures and vitamin A followed by fixation for light microscopy (SEM) revealed progressive cellular damage as the temperature increased and some vitamin uptake which is being studied further, buy biochemical techniques.

535,759
AD-A153 855/2/GAR PC **A05/MF A01**
University of Western Ontario, London. Dept. of Biochemistry.
Microwave-Induced Cataracts of the Eye Lens: Strategies for Modelling and Prevention in Vitro and in Vivo.
Annual summary rept. 1 Sep 81-30 May 82,
J. R. Trevithick. Jun 82, 81p
Grant DAMD17-81-G-9497

Rat ocular lenses were studied after fixation and critical point drying of the tissue by scanning electron microscopy (SEM) following exposures to elevated temperatures and/or microwave irradiation in a thermostatically controlled chamber. In this way, the temperature of the lens bathing medium was set independently of the temperature increase normally associated with application of microwave power. Irradiations were done at three final temperatures and five specific absorption rates (SAR) for two durations. These were accomplished at 915 MHz in WR975 waveguide with either pulsed (Pu) or continuous wave (CW) radiation of equal average power. The parameters of the (Pu) radiation were selected to maximize the production of thermoacoustic expansion. In addition to the types of damage noted on previous progress reports: (1) immediately after pulsed microwave irradiation, holes in cell membranes (2) after incubation for 48 hr, globular degeneration including very large globules at high SAR's and 37 C, this work has investigated possible reciprocity between time and SAR; and threshold dosage (for 6 min exposures) for damage to lenses in vitro by pulsed microwaves at low average power ratings but high peak power in the pulses.

535,760
AD-A153 861/0 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Effects of Pre- and Post-Irradiation Glucan Treatment on Pluripotent Stem Cells, Granulocyte, Macrophage and Erythroid Progenitor Cells, and Hemopoietic Stromal Cells.
Scientific rept.,
M. L. Patchen, T. J. MacVittie, and L. M. Wathen. 1984, 5p Rept no. AFFRI-SR85-15
Availability: Pub. in Experientia, v40 p1240-1244 1984 (No copies furnished by DTIC/NTIS).

Glucan, a beta-1,3 polyglucose, was administered to mice either 1 h before or 1 h after a 650 rad exposure to cobalt-60 radiation. Compared to radiation controls, glucan-treated mice consistantly exhibited a more rapid recovery of pluripotent stem cells and committed granulocyte, macrophage, and erythroid progenitor cells. This may partially explain the mechanism by which glucan also enhances survival in otherwise lethally irradiated mice.

535,761
AD-A153 865/1 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Soluble Polyglycans Enhance Recovery from Cobalt-60 -- Induced Hemopoietic Injury,
M. L. Patchen, N. R. DiLuzio, P. Jacques, and T. J. MacVittie. 1984, 7p Rept no. AFRRI-SR85-14
Availability: Pub. in Jnl. of Biological Response Modifiers, v3 n6 p627-633 1984 (No copies furnished by DTIC/NTIS).

Six soluble polyglycans (glucan-C, glucan-F, glucan-S, krestin, lentinan, and schizophyllan), two soluble polymannans (mannan-A and mannan-R), and one soluble polyfructan (levan) were assayed for their ability to enhance hemopoietic recovery in C3H/HeN mice when administered either 1 h before or 1 h after a 6.5-Gy dose of cobalt-60 radiation. Hemopoietic recovery was measured by the endogenous spleen colony assay and was compared with recovery in both radiation control mice and irradiated mice treated with glucan-P (a particulate polyglycan previously shown to enhance recovery from radiation-induced hemopoietic injury). Compared with radiation controls, when administered before irradiation, mannan-A, glucan-F, and glucan-S enhanced endogenous colony formation 4.2-5.1-fold (equivalent to glucan-P), and levan and schizophyllan approxi. 2.7-fold. Lentinan, krestin, mannan-R, and glucan-C did not enhance hemopoietic recovery above radiation controls under these conditions. When polyglycan administration was delayed until after irradiation, endogenous colony formation was enhanced 3.0-3.9-fold by mannan-A, schizophyllan, glucan-S, krestin, and glucan-F (at least comparable with glucan-P) but not at all by mannan-R, levan, lentinan, or glucan-C.

535,762
AD-A153 880/0/GAR PC **A02/MF A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Effect of Gamma-Irradiation on the Healing of Gastric Biopsy Sites in Monkeys: An Experimental Model for Peptic Ulcer Disease and Gastric Protection.
Special rept.,
A. Dubois, E. D. Dorval, L. R. Wood, J. E. Rogers, and L. O'Connell. Jan 85, 8p Rept no. AFRRI-SR85-3
Pub. in Gastroenterology, v88 n1 pt2 Jan 83.

The acute effects of gamma-irradiation on the gastric mucosa have been studied in a primate model. Fiberoptic gastroscopies were performed in 6 rhesus monkeys in the basal state as well as 3 h and 3, 7, and 9 days after total body irradiation (800 rads). Gastric biopsy specimens (diameter 1 mm) obtained during each session were examined using light microscopy and scanning electron microscopy; in addition, subsequent healing of the biopsy sites was assessed visually. Gastric biopsy sites were completely healed in 3 days in the basal state; in contrast, ulcer craters (diameter 1 mm) microscopic were still present at the site of the biopsies 3, 7, and 9 days after the biopsies were performed in irradiated animals. Light microcopic examination of the biopsy specimens demonstrated only lymphocytic infiltration of the lamina propria. In contrast, scanning electron microscopic examination revealed that the size and number of microvilli of the gastric surface epithelial cells were increased onthe day of irradiation compared to basal; 3-9 days later, numerous gastric surface epithelial cells were damage or had dissappeared so that bare areas of the lamina propria were visible in the specimens taken outside of the ulcer craters.

535,763
AD-A153 890/9/GAR PC **A02/MF A01**
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Alterations in Gastric Mucus Secretion in Rhesus Monkeys after Exposure to Ionizing Radiation,
Special rept.,
T. Shea-Donohue, E. Danquechin-Dorval, E. Montcalm, H. El-Bayar, and A. Durakovic. Mar 85, 6p Rept no. AFRRI-SR85-16
Pub. in Gastroenterology, v88 n3 p685-690 Mar 85.

Group 6R—Radiobiology

The aim of the present study was to evaluate the effect of gamma-irradiation on soluble gastric mucus. Six conscious chair-adapted rhesus monkeys were studied once before and twice after exposure to ionizing irradiation (800 rads). Using a marker (99mTc-DTPA) dilution technique, acidic glycoprotein (AG), neutral glycoprotein (NG), ion, and fluid output were determined during a basal period and after the administration of an 80-ml water load. Irradiation significantly increased the outputs of both AG and NG during the basal period. After the water load, NG output remained elevated but irradiation abolished postload AG output thus inhibiting the normal rise in AG output stimulated by the load. Two days after irradiation NG output was still suppressed. Sodium and potassium ion outputs were unaltered by irradiation. Chloride and fluid outputs were significantly inhibited on the day of irradiation but had returned to control levels within 3 days. These results indicate that irradiation produces significant changes in both the quantity and nature of the soluble mucus glycoproteins secreted into the gastric juice. It is suggested that these changes may compromise the protective ability of gastric mucus.

535,764
AD-A153 894/1 Not available NTIS
Armed Forces Radiobiology Research Inst., Bethesda, MD.
Radiation Abrogation of Myelopoietic Inhibitors Found in Thymus-Conditioned Medium.
Scientific rept.,
D. F. Gruber. 1985, 9p Rept no. AFRRI-SR85-5
Availability: Pub. in Thymus, v7 p3-11 1985 (No copies furnished by DTIC/NTIS).

We have previously reported conditioned medium from cultures of murine 'nonlymphoid' adherent thymus cells to be a source of myelopoietic inhibitor substance(s). The inhibitor has a molecular weight of less than 1000 daltons. It is dialyzable and its effects are reversible with washing, but it is not significantly cytotoxic. The inhibitor(s) abrogate both the 10-day granulocyte-macrophage colony-forming cell (GM-CFC) and the 25-day monocyte-macrophage colony-forming cell (M-CFC). Morphologically, cultures appear to be lymphocyte-free after 10-12 days, and consist primarily (80%) of nonspecific esterase positive cells and epitheloid appearing (20%), nonspecific esterase negative cells. Radiation of thymic cultures at 12 days reduces levels of inhibitor(s) found in the medium. Inhibitor levels from pooled samples collected over 4 days demonstrate reductions of 10% at 100 rads 15% at 22 rads, 25% at 300 rads, and 85% at 400 rads. The steepest area of radiation reduction occurs between 300 and 400 rads, with the interpolated 50% radiation reduction level at 342 rads. Analysis of once harvested radiation culture supernates showed no significant inhibitors present when medium was examined 5-10 days postradiation.

535,765
DE85008550/GAR PC **A02**/MF **A01**
Duke Univ., Durham, NC.
Action Spectrum for the Induction of Phage lambda in E. Coli Strain AB1886 by Uv Light.
D. J. Fluke, E. C. Pollard, and C. E. Bronner. 1984, 15p CONF-8403123-2
Contract AS05-76EV03631
32. annual scientific meeting of Radiation Research Society, Orlando, FL, USA, 1 Mar 1984.

By observing a series of dose/response relationships at different wavelengths of ultraviolet light in comparison with a dose/response at predominantly 254 nm on the same day's culture, a series of comparative values for the effectiveness of ultraviolet light in inducing lambda, as seen by cell lysis, has been measured. The resulting action spectrum, in comparison with DNA absorption, is more effective between 270 and 290 nm than at 313 nm. 5 references, 3 figures. (ERA citation 10:023144)

535,766
DE85009667/GAR PC **A02**/MF **A01**
Duke Univ., Durham, NC. Dept. of Zoology.
Radiation Damage and Repair in Cells and Cell Components. Final Report. Part 1.
D. J. Fluke. 1984, 19p DOE/EV/03631-13-Pt.1, ORO-3631-13-Pt.1
Contract AS05-76EV03631

An overview of research into the direct action of ionizing radiation, especially the effect of radiation temperature, primarily upon enzymes, into induced repair, and into S.O.S.-related phenomena, is presented. (ERA citation 10:023147)

535,767
DE85009934/GAR PC **A05**/MF **A01**
Duke Univ., Durham, NC. Dept. of Zoology.
Radiation Damage and Repair in Cells and Cell Components. Part 2. Physical Radiations and Biological Significance. Final Report.
D. J. Fluke. Aug 84, 95p DOE/EV/03631-13-Pt.2-Rev., ORO-3631-13-Pt.2-Rev.
Contract AS05-76EV03631

The report comprises a teaching text, encompassing all physical radiations likely to be of biological interest, and the relevant biological effects and their significance. Topics include human radiobiology, delayed effects, radiation absorption in organisms, aqueous radiation chemistry, cell radiobiology, mutagenesis, and photobiology. (ERA citation 10:023148)

535,768
DE85009645/GAR PC **A02**/MF **A01**
Duke Univ., Durham, NC. Dept. of Zoology.
Multi-Hit Weigle-Reactivation of Uv-Phage lambda in a Fraction of Complexes with Uv-E. Coli K12.
D. J. Fluke, C. E. Bronner, and E. C. Pollard. 1983, 16p CONF-830220-2
Contract AS05-76EV03631
31. annual meeting of the Radiation Research Society - epidemiology of irradiated human populations, San Antonio, TX, USA, 27 Feb 1983.

While W-reactivation plaque survival curves conform reasonably well to dose-modifying factors through most of the lower range in plaque survival, substantial departures from a DMF description occur in the first decade of plaque survival. For 265-nm uv lambda in 265-nm uv E. coli AB1157 we have reported results consistent with 5 to 7 hits repaired in about 15% of complexes at maximum, with single-hit plaque survival at the same D sub 0 in the other 85%. Subsequent extension of these results over five decades of plaque survival show, at maximum W-reactivation, a 5-hit repair in 19% of the complexes, with a consistent D sub 0 throughout, about 13.4 J/m exp 2 . Graded induction of the cells primarily changes the fraction of complexes giving the W-reactivation, and the maximum fraction is substantially independent of cell growth stage. At maximum W-reactivation, induced cells incubated post-uv showed some decline in the number of hits repairable, rather more decline in the fraction of complexes giving the W-reactivation, while holding fairly steady in D sub 0 . The further studies also indicate that the process conforms very well to multi-hit target theory, although two other shouldered-curve models give fairly similar numerical results. 3 figures, 2 tables. (ERA citation 10:023142)

535,769
DE85780302/GAR PC **A06**/MF **A01**
Ulm Univ. (Germany, F.R.). Fakultaet fuer Theoretische Medizin.
Occupational Disease Caused by Ionizing Radiation. An Analysis of Currently Indemnified Cases in the Federal Republic of Germany.
Diss. (Dr.med.),
H. U. Kluepfel. 24 Jun 83, 112p INIS-mf-9149
In German.
U.S. Sales Only.

The study investigates the course of the disease of persons whose occupational exposure to radiation had resulted in impairment of their professional ability and entitled them to damages under the current regulations. 35 receivers of damages were found. Answering the question form and partly giving permission to study their files at the insurance institution under the conditions of data protection made it possible to carry this investigation through. 14 receivers of damages were occupied in the technical industry, 21 in the sector of medicine. The radiation disease acknowledged as professional concerned in 30 cases the skin, in two cases the lungs and in one case each the haematopoietic system, the eyes and the pelvic organs. In 8 indemnified cases, acute radiation exposure had caused the disease, in 25 the time of exposure had ranged from one year to several decades. The investigation describes when and under what professional circumstances the radiation exposure took place, the course of the disease, what kind of diagnostic and therapeutical measures were carried through and what personal and professional consequences the indemnified sustained. It gives suggestions to set up a future, more effective documentation system on the basis of the experience gathered on the occasion of this investigation with the currently valid registration system, which is unsuitable for further scientific studies, and with the currently practiced methods of after-care. (Atomindex citation 15:057043)

535,770
DE85780536/GAR PC **A02**/MF **A01**
Nuclear Energy Board, Dublin (Ireland).
Code of Practice. Safe Use of Ionizing Radiation in Secondary Education.
C. Doyle, C. Hone, and N. V. Nowlan. May 84, 24p NEB-84/3
Also available from: Nuclear Energy Board, 20 Lr. Hatch Str., Dublin 2.
U.S. Sales Only.

This Code of Practice introduces accepted safety procedures associated with the use of alpha, beta, gamma and X-radiation in secondary schools (pupils aged 12 to 18) in Ireland, and summarises good practice and procedures as they apply to radiation protection. Typical dose rates at various distances from sealed sources are quoted, and simplified equations are used to demonstrate dose and shielding calculations. The regulatory aspects of radiation protection are outlined, and references to statutory documents are given. (Atomindex citation 15:062354)

535,771
PB85-191682/GAR PC **A02**/MF **A01**
Veterans Administration Medical Center, New York.
Biologic Effects of Low-Level Ionizing Radiation: Distinguished Lecturer Series.
R. S. Yalow. Feb 85, 14p EPA/600/M-85/009

This represents the first in a series of lectures sponsored by the Agency to present a range of perspectives on controversial environmental and health issues from the vantage points of distinguished scientists. The views expressed are, therefore, not necessarily the views of the U.S. EPA. The lecture discusses what is known about the health and carcinogenic effects associated with low doses of ionizing radiation. It points out the scientific consensus that there are no reproducible studies unequivocally demonstrating the effects of low-level ionizing radiation and distinguishes between scientific fact and public policy.

6S. Stress Physiology

535,772
AD-A153 413/0/GAR PC **A02**/MF **A01**
Alaska Agricultural Experiment Station, Fairbanks.
Biophysics of Cold Adaptation and Acclimatization: Microbial Decomposition.
Final rept.,
G. A. Laursen. 1 Mar 84, 19p Rept no. AES-83-10
Contracts N00014-77-C-0162, N00014-83-K-0461

The intent of the proposed research was to further elucidate decomposition processes attributed by soil fungi in an Arctic terrestrial environment as those processes relate to the structure and function of decomposition in cold dominated peat soil. The approach was novel in that it was to examine the presence and abundance of total fungal hyphae by a modified Jones and Mollison technique and viable fungal hyphae by either the fluorescein diacetate or oresein techniques of Soderstrom in relationship to: 1) the presence and activities of catabolic enzymes (i.e., chitinase, peroxidases, proteases and cellulase) present in the soil complex, and produced by the fungi; 2) the gravimetric loss of organic litter components (i.e., cellulose, hemicellulose, lignin, acid and neutral solution solubles and remaining residuals) the decomposition of which is largely attributed to soil fungi in moist but not saturated peat soils; 3) the total concentrations of nitrogen in the decomposing system in relation to the overall rate of component weight loss that was not determined because of reduction in funding amounts and duration. Litter bags constituted the experimental pool from which most measurements were taken.

535,773
AD-A153 467/6/GAR PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.

Anthropometric Changes at High Altitude.
C. S. Fulco, A. Cymerman, N. A. Pimental, A. J. Young, and J. T. Maher. Mar 85, 7p Rept no. USARIEM-M-19/84
Pub. in Aviation, Space, and Environmental Medicine, p220-224 Mar 85. Supersedes AD-A140 311.

Eight men (18-25 yr) were evaluated before during and after 18-days residence on the summit of Pikes Peak, CO (4300 m; HA) to describe the anthropometric changes associated with weight loss and to test the accuracy of a number of previously published prediction equations in assessing any alteration of the relative fat-to-lean tissue ratio during exposure to HA. Body weight (BW), ten circumference (C) and seven skin-fold (SF) measurements were obtained preprandial at sea level (SL) and on days 2,4,6,9,12,16 and 18 at HA. Body density was estimated by hydrostatic weighting (HW) pre- and post-HA. BW differed from SL ($P < .01$) after day 9 at HA. HW indicated that the pre- to post HA weight loss was partitioned into a 2.06 kg loss in fat-free body mass ($P < .001$) and an insignificant increase in fat wt (0.58 kg). Percent body fat (BF) increased from 16.6 to 17.7 ($P < .02$). After day 9 of HA, the sum of SF and C measurements increased ($P < .02$) and decreased ($P < .05$) from S1, respectively. The largest changes occurred in the chest and scapula SF and in the C of the hip, neck, calf and 2 abdominal sites. The alterations in triceps, waist and total SF were related to the increase in fat weight and BF ($r > .71$). (Author)

535,774
AD-A153 681/2/GAR PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Plasma Hormonal Responses at Graded Hypohydration Levels during Exercise/Heat Stress.
R. P. Francesconi, M. N. Sawka, K. B. Pandolf, R. W. Hubbard, and A. J. Young. 28 Mar 85, 23p

The effects of graded levels of hypohydration (3 %, 5% and 7%) on hormonal responses to exercise in the heat were examined in six heat-acclimated, male volunteers. On the day following the dehydration procedure, subjects performed light intensity exercise in a hot (49 C, 20% rh) environment for four consecutive 25 min intervals interspeed by 10 min rest periods; a blood sample was obtained prior to exercise and during the last 10 min of each exercise period. Results generally indicated that during euhydration, plasma cortisol levels manifested significant decrements over time, probably related to the normal diurnal periodicity of this hormone. However, during hypohydration, levels of plasma cortisol were increased and correlated with hypohydration intensity. Plasma renin activity was increased significantly by hypohydration, but was unaffected by exercise in the heat. Alternatively, plasma aldosterone levels were increased more consistently by both exercise in the heat and hypohydration. We have demonstrated that hormonal responses are altered by the level of hypohydration and confirmed that the acquisition of heat acclimation probably blunts the hormonal responses during exercise in the heat.

6T. Toxicology

535,775
AD-A153 536/8/GAR PC **A05**/MF **A01**
SRI International, Menlo Park, CA.
Toxicity of TNT (Trinitrotoluene) Wastewaters to Aquatic Organisms. Volume 4. Chronic Toxicity of 2,4-Dinitrotoluene and Condensate Water.
Final rept. 15 Dec 78-30 Apr 82.
H. C. Bailey, R. J. Spanggord, H. S. Javitz, and D. H. W. Liu. Jul 84, 91p Rept no. SRI-LSU-4262
Contract DAMD17-75-C-5056

This report is the last in a series of four reports on the toxicity of 2,4,6-trinitrotoluene (TNT) wastewaters to aquatic organisms. The information presented in the four volumes was developed in a study performed by SRI International for the U.S. Army Medical Research and Development Command (USAMRDC). The study was undertaken to assist USAMRDC in developing a data base for assessing the potential hazards to aquatic life of wastewater from TNT manufacturing and processing plants. This report presents and discusses the results of early life stage and chronic studies on 2,4-dinitrotoluene (2,4-DNT), condensate water, and photolyzed condensate water. 2,4-DNT is a major component of the condensate wastewater that results from treatment of the effluent (red water) that comes from the continuous production of TNT. Condensate water is a synthetic blend based on the actual condensate wastewater and developed by SRI under a separate contract. Early life stage studies were conducted on 2,4-DNT and condensate water with rainbow trout, channel catfish and fathead minnows. Full life-cycle chronic studies were performed on 2,4-DNT and condensate water with fathead minnows and Daphnia magna and on irradiated condensate water with D. magna.

535,776
AD-A153 663/0/GAR PC **A02**/MF **A01**
Defence Research Establishment Suffield, Ralston (Alberta).
In vitro Method for the Screening of Trichothecene Mycotoxin Cytotoxicity and the Study of Mycotoxin Countermeasures.
Memorandum rept.,
V. L. DiNinno, D. Penman, A. R. Bhatti, N. P. Erhardt, and P. A. Lockwood. Mar 85, 12p Rept no. DRES-SM-1147

A thymocytic cell bio-assay was developed for assessing the toxicity of the trichothecene mycotoxin T-2. The in vitro toxicity of mycotoxin T-2 towards mouse mononuclear leukocytes prepared from spleen, thymus, peritoneal lavage and bone marrow cells was studied. Bone marrow cells were found to more resistant to T-2 toxicity than thymus, spleen and peritoneal cell preparations. This method is rapid and provides consistant and reproducible results for the study of T-2 mycotoxicosis.

535,777
DE85007930/GAR PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Beryllosis: A Disease of the past.
G. L. Schweickert. 11 Feb 85, 11p UCRL-90661, CONF-8410257-1
Contract W-7405-ENG-48
Beryllium sub-working group meeting, Aldermaston, UK, 1 Oct 1984.

The natural history of berylliosis remains a toxicological puzzle despite 40 years of investigation. In this paper, the author reviews current theories on the mechanisms of the disease, most of which are based on hypersensitivity of an individual's immune system to Be. He examines over-response as a critical factor using the update Be case registry, carcinogenicity evidence, and experimental animal data. And, comments are presented on the efficacy of industrial hygiene controls, implemented during the 1940's, that have reduced the incidence of beryllium-related disease in the US to nearly zero. 11 references, 2 figures, 1 table. (ERA citation 10:023156)

535,778
DE85008578/GAR PC **A02**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Correlating Survival and DNA Excision Repair in Human Fibroblasts.
J. H. Miller, and R. H. Heflich. Jul 83, 21p PNL-SA-11304
Contract AC06-76RL01830
Portions of this document are illegible in microfiche products.

A model is presented that correlates the survival of cells in tissue culture exposed to toxic agents with the rate of excision of residues bound to DNA. Under the assumptions of the model, data on the survival of normal human fibroblasts (NF) and fibroblasts from xeroderma pigmentosum (XP) patients in complementation groups A, C and E (XPA, XPC and XPE) after exposure to N-acetoxy-2-acetylaminofluorene (N-AcO-AAF) were used to predict the rate of excision of N-AcO-AAF-induced DNA residues by the partially repair deficient cells relative to the rate of excision by NF. These predictions were tested by measurements of the rate of removal of radiolabeled N-AcO-AAF-induced DNA residues by fibroblasts in confluent cultures. In general, XPE removed N-AcO-AAF-induced DNA residues at the rate predicted by the model while the rate of repair by XPC was slower than predicted. The results with XPC indicate that this cell strain not only has a reduced rate of DNA excision repair but also differs from NF in other factors that affect cell survival. 21 references, 2 figures. (ERA citation 10:023155)

535,779
PB85-192946/GAR PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC.
Trimethyltin Reduces Recurrent Inhibition in Rats.
Journal article,
R. S. Dyer, and W. K. Boyes. 1984, 5p EPA/600/J-84/257
Pub. in Neurobehavioral Toxicology and Teratology 6, n5 p369-371 Sep 84.

Rats with electrodes chronically implanted in the perforant path for electrical stimulation, and dentate gyrus for recording were treated with a single oral administration of either saline, 5 mg/kg trimethyltin (TMT) or 6 mg/kg TMT. Recurrent inhibition was assessed by paired pulse activation of the perforant path input to the dentate gyrus. The measure of recurrent inhibition employed was the ratio of the population spike amplitudes of the responses to the first and second of the paired stimuli. Inhibition was assessed immediately before, and at 2, 24 and 120 hrs following TMT. The results indicated a reduction in inhibition as early as 2 hr following treatment, suggesting that TMT-induced destruction of hippocampal pyramidal cells may be secondary to their over-activation from an uninhibited mossy fiber system.

535,780
PB85-192961/GAR PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC.
Chlordimeform Produces Profound, Selective, and Transient Changes in Visual Evoked Potentials of Hooded Rats.
Journal article,
W. K. Boyes, and R. S. Dyer. 1984, 17p EPA/600/J-84/258
Pub. in Experimental Neurology 86, p434-447 1984.

Rat visual function was tested after acute exposure to chlordimeform (CDM), a formamidine insecticide/acaricide. Adult male Long-Evans rats were surgically implanted with epidural recording electrodes overlying visual cortex and tested 1 week later. Pattern reversal-evoked potentials (PREPs), flash-evoked potentials (FEPs), and FEP recovery ratios were measured after acute CDM administration. In the first study, which examined dose-response relationships, i.p. injections of 0 (saline), 5, 15, or 40 mg/kg CDM-HCl were administered 30 min prior to testing. In the second study, which examined the time course of CDM action, PREPs and paired-pulse FEPs were recorded 3, 6, and 24 h after dosage with either 0 or 40 mg/kg CDM. In summary, acute exposure to CDM temporarily increased both the amplitude and latency of PREPs, but only the latency of FEPs.

535,781
PB85-193084 Not available NTIS
University of Southern Mississippi, Hattiesburg.
Serological Alterations in Carcinogen-Exposed Teleosts: Procedures for Preparation and Analysis of Samples from Small Fish.
Journal article,
C. B. Meador, R. L. Middlebrooks, and B. J. Martin. c1984, 9p EPA/600/J-84/269
Pub. in National Cancer Institute Monograph 65, p211-216 May 84.

To study the effects of environmental carcinogens on the immune system of Cyprinodon variegatus, the authors had to miniaturize or modify standard immunological procedures due to the small size of the fish. Modifications in standard bleeding procedures allowed collection of sufficient serum for most seriological procedures. Serum electrophoresis showed considerable variation between exposed and unexposed fish as did qualitative immunoelectrophoresis techniques. They successfully adapted a bacteriophage neutralization procedure for use with the C. variegatus system to measure antiviral antibodies. The presence of antibody-forming cells in spleen suspensions from fish immunized with human type 0 erythrocytes was demonstrated by a modified immune rosette procedure. A capillary tube procedure was developed for separation of leukocytes from erythrocytes in blood from C. variegatus.

535,782
PB85-193092 Not available NTIS
University of West Florida, Pensacola. Dept. of Biology.

Histopathological Changes in Grass Shrimp Exposed to Chromium, Pentachlorophenol and Dithiocarbamates.
Journal article,
K. R. Rao, and D. G. Doughtie. c1984, 28p EPA/600/J-84/270
Pub. in Marine Environmental Research 14, p371-395 Aug 84.

This report deals with the histopathological/ultrastructural changes in various tissues of grass shrimp (Palaemonetes pugio) exposed to hexavalent chromium, pentachlorophenol (PCP) and two dithiocarbamate formulations: Aquatreat DNM-30 (15% sodium dimethyl dithiocarbamate plus 15% disodium ethylene bis-dithiocarbamate) and Busan-85 (50% potassium dimethyl dithiocarbamate). The pathological alterations induced by dithiocarbamates and PCP were most severe and first evident in the gills. Of the biocides tested, the dithiocarbamates caused the most extensive branchial damage--the so-called black gill syndrome, involving early melanization and eventual lamellar truncation.

535,783
PB85-193100 Not available NTIS
University of Southern Mississippi, Hattiesburg.
Primary Cell Cultures from the Teleost, 'Cyprinodon variegatus': Culture Establishment and Application in Carcinogen Exposure Studies.
Journal article,
B. J. Martin, R. D. Ellender, S. A. Hillebert, and M. M. Guess. c1984, 7p EPA/600/J-84/271
Pub. in National Cancer Institute Monograph 65, p175-178 May 84.

Methods were developed for aseptic maintenance of Cyprinodon variegatus fry for extended periods. Preliminary studies indicated that under optimum conditions sterile embryos develop normally for a sufficient time to function as carcinogenteratogen assay systems. An embryo-primary cell culture technique was developed that incorporates, in a single system, certain characteristics of both intact embryos and primary cell cultures and allows simultaneous observation of the effects of carcinogens on the whole organism and primary cell monolayers. The effective use of these systems provides one the opportunity to study the effects of carcinogens on teleosts at the cellular and organismic level.

535,784
PB85-193142/GAR PC **A04**/MF **A01**
University of Southern California, Los Angeles. School of Medicine.
Role of Air Pollutants in Facilitation of Cancer Cell Metastasis.
Final rept. 6 Jun 83-31 Dec 84,
A. Richters. 30 Nov 84, 57p ARB-R-85/241
Contract ARB-A2-128-33

The authors' previous studies have indicated that NO2 facilitates blood borne melanoma cancer cell metastasis to the lungs of exposed mice. The studies described in this report were designed to improve the sensitivity of the method, to evaluate other pollutant effects and to determine effects of NO2 on the growth of a primary rat adenocarcinoma. These experiments have provided new information which indicates that inhalation of common air pollutants at ambient levels may be more hazardous than previously recognized.

535,785
PB85-193738 Not available NTIS
Health Effects Research Lab., Research Triangle Park, NC.
Mouse Skin Tumor-Initiating Activity of Benz(e)aceanthrylene and Benz(j)aceanthrylene in Sencar Mice.
Journal article,
S. Nesnow, A. Gold, R. Sangaiah, L. L. Triplett, and T. J. Slaga. c1984, 8p EPA/600/J-84/259
Prepared in cooperation with North Carolina Univ. at Chapel Hill. Dept. of Environmental Sciences and Engineering, and Oak Ridge National Lab., TN. Biology Div.
Pub. in Cancer Letters 22, p263-268 1984.

Benz(e)aceanthrylene and benz(1)aceanthrylene, cyclopenta-fused derivatives of benz(1)anthracene, have been reported to be active bacterial cell and mammalian cell gene mutagens. In this study they were evaluated as skin tumor initiators in both male and female SENCAR mice. Both PAH induced papilloma formation in the range of 50-1000 nmol/mouse. Benz(1)aceanthrylene was the most active, being approximately 4 times as activeas benzo(a)pyrene while benz(e)aceanthrylene had activity approximately equivalent to benzo(a)pyrene. These results are in contrast to those reported for the air pollutant, cyclopenta(cd)pyrene, another cyclopenta-fused PAH, which is a weak mouse skin tumor initiator. The authors postulate that these cyclopenta-PAH are formed by pyrosynthetic routes similar to other environmental cyclopenta-PAH and that they may be of importance as contributors to air pollution carcinogenesis. (Copyright (c) 1984 Elsevier Scientific Publishers Ireland Ltd.)

535,786
PB85-193761/GAR PC **A09**/MF **A01**
SRI International, Menlo Park, CA.
In vitro Microbiological Mutagenicity and Unscheduled DNA Synthesis Studies of Fifteen Pesticides.
Final rept. on Phase 3,
V. F. Simmon, E. S. Riccio, D. E. Robinson, and A. D. Mitchell. Apr 85, 181p LSU-3493, EPA/600/1-85/006
Contract EPA-68-01-2458

Fifteen pesticides being reviewed as part of the EPA Substitute Chemical Program were examined by SRI International by several in vitro test procedures, for the following: Reverse mutation in Salmonella typhimurium strains TA1535, TA1537, TA98, and TA100 and in Escherichia coli WP2, induction of mitotic recombination in the yeast Saccharomyces cerevisiae D3, relative toxicity in DNA repair-proficient and repair-deficient strains of E. coli (strains W3110 and p3478, respectively) and of Bacillus subtilis (strains H17 and M45, respectively), and, unscheduled DNA synthesis (UDS) in human fibroblasts (WI-38 cells). None of the fifteen pesticides demonstrated genetic activity in all six of the in vitro assays. Bioallethrin was the only pesticide that was mutagenic in the S. typhimurium reverse mutation assay. Manzate-D and manzate 200 increased both mitotic recombination in S. cervisiae D3 and UDS in WI-38 cells. Dithane M-22, dithane M-45, ethylchrysanthemate, and zineb increased mitotic recombination in S. cervisiae D3. DL-cis/trans chrysanthemic acid was genotoxic in the relative toxicity assay, being more toxic to the repair-deficient (rec(-)) B. subtilis strain M45 than to the repair-proficient (rec(+)) strain H17.

535,787
PB85-193969/GAR PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC.
Mutagenicity of Cyclopenta-Fused Isomers of Benz(a)anthracene in Bacterial and Rodent Cells and Identification of the Major Rat Liver Microsomal Metabolites.
Journal article,
S. Nesnow, S. Leavitt, R. Easterling, R. Watts, and S. H. Toney. Nov 84, 14p EPA/600/J-84/260
Pub. in Cancer Research 44, p4993-5003 Nov 84.

The microsomal metabolites and mutagenic activity of four cyclopenta-fused benz(a)anthracenes; benz(j)aceanthrylene (B(j)A), benz(e)aceanthrylene (B(e)A), benz(l)aceanthrylene (B(l)A) and benz(k)acephenanthrylene (B(k)A) have been studied. Arocolor-1254 induced rat liver microsomes metabolized B(j)A to: B(j)A-1,2-dihydrodiol, B(j)A-9,10-dihydrodiol, B(j)A-11,12-dihydrodiol and 10-hydroxy-B(j)A; B(e)A to: B(e)A-1,2-dihydrodiol, B(e)A-3,4-dihydrodiol, and B(e)A-5,6-dihydrodial; B(l)A to: B(l)A-1,2-dihydrodiol, B(l)A-4,5-dihydrodiol and B(l)A-7,8-dihydrodiol; and B(k)A to B(k)A-4,5-dihydrodiol and B(k)A-89-dihydrodiol. With each PAH, metabolism occurred on the cyclopentaring. All four isomers were active as gene mutagens in S. typhimurium and in Chinese hamster V79 cells. In the S. typhimurium mutation studies using Aroclor-1254 induced rat liver S9, B(j)A, B(e)A, and B(l)A required significantly less microsomal protein for maximal mutation response than B(k)A and B(a)P suggesting a one-step activation mechanism, presumably on the cyclopenta-fused ring. B(j)A, B(e)A, and B(l)A were significantly more mutagenic than B(k)A and B(a)P in S. typhimurium.

535,788
PB85-194058/GAR PC **E06**/MF **E06**
Commission of the European Communities, Luxembourg.

Report of the Second Stage in Development of a Standardized Laboratory Method for Assessing the Toxicity of Chemical Substances to Earthworms,
C. A. Edwards. c1984, 105p EUR-9360-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The inter-laboratory intercalibration ring test assessing the validity and reproducibility of proposed contact filter paper, artificial soil and an 'artisol' toxicity test for the earthworm E. foetida in 1981/2 involved the assessment of the toxicity of pentachlorophenol, carbaryl, trichloroacetic acid (unknown test chemicals) and copper sulphate, by 60 laboratories in 18 countries. The order of toxicity were pentachlorophenol > carbaryl < copper sulphate > trichloroacetic acid. The contact test gave the most reproducible results, was difficult to interpret and the data gave only potential toxicity hazards, the artificial soil test, although slightly less precise and rather more time-consuming, gave much more readily interpreted data.

535,789
PB85-861599/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cadmium Pollution. November 1980-April 1983 (Citations from the NTIS Data Base).
Rept. for Nov 80-Apr 83.
Jun 85, 229p

This bibliography contains citations concerning air and water pollution by cadmium. Topics include detection, monitoring, and analysis of cadmium in the environment. Also included are topics on sources, control techniques, emissions, transport properties, toxicity, and effects studies, for plants, animals, and humans. (This updated bibliography contains 231 citations, none of which are new entries to the previous edition.)

535,790
PB85-861607/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cadmium Pollution. May 1983-May 1985 (Citations from the NTIS Data Base).
Rept. for May 83-May 85.
Jun 85, 264p
Supersedes PB83-806505.

This bibliography contains citations concerning air and water pollution by cadmium. Topics include detection, monitoring, and analysis of cadmium in the environment. Also included are topics on sources, control techniques, emissions, transport properties, toxicity, and effects studies, for plants, animals, and humans. (This updated bibliography contains 259 citations, all of which are new entries to the previous edition.)

535,791
PB85-861623/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Toxicity of Nickel. June 1983-May 1985 (Citations from the Energy Data Base).
Rept. for Jun 83-May 85.
Jun 85, 193p
Supersedes PB84-864784. Prepared in cooperation with Department of Energy, Washington, DC.

This bibliography contains citations concerning the toxicity, carcinogenicity, environmental pollution, and other hazards of nickel. Environmental pollution assays, biological monitoring methods, and chemical assays for the detection of nickel are discussed. The toxicity of nickel to aquatic and terrestrial flora and fauna, including man, are considered. (This updated bibliography contains 183 citations, 90 of which are new entries to the previous edition.)

7. CHEMISTRY

7A. Chemical Engineering

535,792
AD-A153 415/5 Not available NTIS
California Univ., Berkeley. Dept. of Chemical Engineering.
Plasma-Enhanced Chemical Vapor Deposition of Beta-Tungsten, a Metastable Phase,
C. C. Tang, and D. W. Hess. 15 Sep 84, 4p ARO-19996.2-MS
Contract DAAG29-83-K-0039
Availability: Pub. in Applied Physics Letters, v45 n6 p633-635, 15 Sep 84 (No copies furnished by DTIC/NTIS).

Plasma-enhanced chemical vapor deposition of a metastable phase of tungsten (beta-W) is performed using tungsten hexafluoride and hydrogen as source gases. At 350 C, the as-deposited resistivity of these films is about 50 micron omega cm. After heat treatments between 650 and 750 C in forming gas, the resistivity drops below 11 micron omega cm. Concomitant with this resistivity change is a phase change to alpha-W, the equilibrium, body-centered-cubic form.

535,793
PB85-192847/GAR PC **A07/MF A01**
Environmental Protection Agency, Cincinnati, OH. Hazardous Waste Engineering Research Lab.
Innovative Thermal Hazardous Waste Treatment Processes,
H. M. Freeman. Apr 85, 135p EPA/600/2-85/049

This report contains discussions of 21 thermal processes identified by the U.S. Environmental Protection Agency (U.S. EPA) as innovative processes for treating or destroying hazardous organic wastes. The subject processes were identified through two national solicitations for innovative processes and several extensive literature surveys. Information about the subject processes was provided voluntarily by the process developers. The criteria used for selection of a process for the report included the innovativeness of the process when compared with conventional existing processes and the potential contribution the process could make to the evolving field of hazardous waste management technology.

535,794
PB85-861904/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Fermentation Processes. June 1970-June 1985 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Jun 85.
Jun 85, 125p
Supersedes PB84-871953.

This bibliography contains citations concerning fermentation techniques, enzymes, and enzyme technology used in the production of alcohols and other products. Continuous fermentation processes, and the application of computer technology to fermentation control are also considered. (This updated bibliography contains 163 citations, 36 of which are new entries to the previous edition.)

7B. Inorganic Chemistry

535,795
AD-A153 554/1/GAR PC **A02/MF A01**
Pennsylvania Univ., Philadelphia. Dept. of Chemistry.
New Synthetic Routes to Boron Cage Compounds.
Final rept. 16 Nov 81-15 Nov 84,
L. G. Sneddon. 10 Feb 85, 5p ARO-18563.16-CH
Contract DAAG29-82-K-0005

Polyhedral boron cage compounds have been recognized as having numerous potentially important practical applications due to their unique chemical and physical properties. Unfortunately this potential has been largely unrealized because of the non-selective, low yield synthetic methods required to obtain these compounds. The principle thrust of the work performed under ARO sponsorship was to investigate the fundamental processes involved in the formation of these types of compounds and to apply these techniques to the development of new high yield, two energy, selective synthetic routes. Our work has demonstrated (1) new catalytic, high yield syntheses of alkenyl boranes and alkenyl carboranes (2) the high yield thermally initiated conversion of alkenylpentaboranes into small cage carboranes (2) new routes to large cage monocarbon carboranes (3) new catalytic routes to multicage compounds and (4) the synthesis of a range of new hybrid cluster systems with unique structural properties.

535,796
AD-A153 567/3 Not available NTIS
Purdue Univ., Lafayette, IN. Richard B. Wetherill Lab.
Addition Compounds of Alkali-Metal Hydrides. 24. A General Method for Preparation of Potassium Trialkoxyborohydrides. A New Class of Reducing Agents,
H. C. Brown, J. S. Cha, and B. Nazer. 1984, 5p ARO-18776.10-CH
Contract DAAG29-82-K-0047
See also AD-A132 971.
Availability: Pub. in Inorganic Chemistry, v23 n19 p2929-2931 1984 (No copies furnished by DTIC/NTIS).

The generality of the synthesis of potassium triisopropoxyborohydride, stabilized toward disproportionation by storing over excess potassium hydride, was examined with seven additional organoborates of varying steric requirements. The reaction of trimethoxy- and triethoxyborane with potassium hydride proceeded readily at room temperature, but the products could not be stabilized by the presence of excess potassium hydride. Triphenoxyborane reacted readily, even at -10 C and stabilization was achieved. Tri-sec-butoxy-and tricyclopentoxyborane required refluxing in THF for 12-24 h, and the products were stabilized over potassium hydride. Finally, the reactions of tris(2-methylcyclohexoxy)- and tri-tert-butoxyborane were even slower, requiring a number of days for completion. Both products were stabilized toward disproportiontion without excess potassium hydride. The stereoselectives of these reagents in the reduciton of representative cyclic ketones were examined. The stereoselectivities varied in an erratic manner with the steric requirements of the alkoxy group and did not approach the stereoselectives previously achieved with lithium tri-sec-butylborohydride and lithium trimethylborohydride.

535,797
AD-A153 687/9/GAR PC **A02/MF A01**
University of Southern California, Los Angeles.
Preparation of Nitrocompounds.
Final rept. 15 Nov 81-14 Nov 84,
G. A. Olah. 29 Jan 85, 6p ARO-18608.6-CH
Contract DAAG29-82-K-0009

New methods for preparation of nitrocompounds were studied including nitration with nitric-fluorosulfuric acid, transfer nitrations with N-nitropyrazole and-imidazole, solid superacid (Nafion-H) catalyzed nitrations and reactions with nitronium salts.

7C. Organic Chemistry

535,798
AD-A153 453/6/GAR PC **A02/MF A01**
Walter Reed Army Inst. of Research, Washington, DC.
Facile Synthesis of Unsymmetrical Heterocyclic Azines by Cyclodesulfurization. Reaction of Methyl Arylalkylidenehydrazinecarbodithioates with Diamines,
A. J. Lin, and D. L. Klayman. Feb 85, 6p
Pub. in Jnl. of Heterocyclic Chemistry, v22 p1-4 Jan-Feb 85.

A new and facile synthesis of unsymmetrical heterocyclic azines is described. Methyl arylalkylidenhydrazinecarbodithioates, prepared by the condensation of ketones with methyl hydrazinecarbodithioate, were heated under reflux with various diamines in ethanol. Secondary diamines, such as N,N'-dimethylethylenediamine, N,N'-dimethyl-1,3-diaminopropane or N-N'-dimethyl-phenylenediamine, reacted smoothly with loss of hydrogen sulfide to give good yields of unsymmetrical azines. However, primary diamines, such as ethylenediamine or phenylenediamine, and primary/secondary diamines, such as N-methylethyl-enediamine and N-methyl-1,3-diaminopropane gave instead, only the corresponding uncyclized thiosemicarbazones. A cyclodesulfurization mechanism for azine formation is discussed.

535,799
AD-A153 454/4 Not available NTIS
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
Olefinations with a Polymer-Supported Phosphinate,
A. E. Qureshi, and W. T. Ford. 1984, 4p ARO-19156.3-CH
Contract DAAG29-82-K-0133, Grant NSF-CHE81-06157
Availability: Pub. in British Polymer Jnl., v16 p231-233 Dec 84 (No copies furnished by DTIC/NTIS).

The Wittig reaction and its modifications are the most generally useful methods available for the regiospecific introduction of carbon-carbon double bonds in organic synthesis. The use of insoluble polymer-bound Wittig reagents has enabled olefin syntheses in good yields with separation of the triarylphosphine oxide by-product by simple filtration of the polymer. This paper reports a modified polymerbound Wittig reagent, ethyl 4-polystyryl(ethylphosphino) acetate. A phosphinate or phosphine oxide, rather than the more common phosphonate, was the structure of choice for the phosphoryl carbanion-stabilising group of the polymeric reagent, because the covalent carbon-phosphorus bond should prevent cleavage of the organophosphorus species from the polymer, When olefinations are carried out with soluble organophosphorus reagents, there is usually no advantages of phosphinates over phosphonates. The phosphonates are more readily available due to the preparation fromtrialkyl phosphites and alkyl halides. The synthesis of phosphinate esters by the Michaelis-Arbuzov reaction requires the less available dialkyl phosphonites as starting materials.

535,800
AD-A153 455/1 Not available NTIS
Purdue Univ., Lafayette, IN. Richard B. Wetherill Lab.
Convenient Procedure for the Synthesis of (E)-1-Bromo-1-alkenes and (Z)-1-Iodo-1-alkenes,
H. C. Brown, and V. Somayaji. Nov 84, 3p ARO-18776.20-CH
Contract DAAG29-82-K-0047
Availability: Pub. in Communications, p919-920 Nov 84 (No copies furnished by DTIC/NTIS).

We have earlier described the synthesis of (E)-1-iodo-1-alkenes and (Z)-1-bromo-1-alkenes in excellent stereo-chemical purities from (E)-1-alkenylboronic acids, readily available via the hydroboration of 1-alkynes. These vinyl halides find extensive application in the stereo-specific synthesis of biologically important molecules such as sex pheromones containing the 1,3-diene grouping. In view of the synthetic importance of these vinyl halides, it was desirable to have available a convenient synthesis of (Z)-1-iodo-1-alkenes and (E)-1-bromo-1-alkenes, We have now developed such a synthesis.

7D. Physical Chemistry

535,801
AD-A153 405/6/GAR PC **A02/MF A01**
California Univ., Santa Barbara. Dept. of Chemistry.

Preparation of Well-Defined Surfaces at Atmospheric Pressure: Studies of Structural Transformations of I, Ag-Adlattices on Pt(111) by LEED and Electrochemistry,
A. Wieckowski, B. C. Schardt, S. D. Rosasco, J. L. Stickney, and A. T. Hubbard. 1984, 21p AFOSR-TR-85-0335
Grant AFOSR-81-0149
Pub. in Surface Sciece, v146 p115-134 1984.

Pt(111) surfaces disordered by ion-bombardment or electrochemical oxidation were converted to well-defined, ordered states by annealing in iodine vapor at atmospheric pressure. A structure not obtainable in vacuum was formed. Pt(111)(3 x the square root of 3 x 9 x the square root of 3) R 30 deg-I, containing 0.62 I atoms per surface Pt atom in a slightly distorted hexagonal array. The I-I interatomic distances in this structure, 0.33 and 0.36 nm, were less than the Van der Waals distance, 0.43 nm. Gentle heating of this structure under pure Ar yielded I2 molecules. I atoms and a series of structures. The Pt (111 x the square root of 7 x the square root of seven)R 19.1 deg.- I adlattice proved to be identifiable from its distinctive electrochemical behavior in electrodeposition of Ag from aqueous solutions of AgClO4, which consists of three prominent structural transitions. Kinematic calculations of the directions and qualitative intensities of the LEED beams at selected kinetic energies has led to proposed structures consisting of Ag atoms close-packed in registry with the three-fold sites of Pt but with I atoms substituted for Ag atoms at the (square root of 3 x square root of three)R30 deg positions. Phase boundaries caused by reversals of the two packing sites of the square root of 3 unit mesh at intervals 17 Pt unit vectors divide the surface into hexagonal antiphase domains. .

535,802
AD-A153 407/2/GAR PC **A03/MF A01**
State Univ. of New York at Stony Brook. Dept. of Chemistry.
Light Scattering and Spectroscopic Studies of Polymerization Processes.
Final rept.1 Feb 82-31 Jan 85,
B. Chu. 1 Mar 85, 27p 5010D, ARO-18675.8-CH
Contract DAAG29-82-K-0044
See also report dated 9 Sep 81, AD-A116 908.

During the thermal polymerization of monomers such as methyl methacrylate (MMA) or styrene, we have been able to investigate both the static and the dynamic properties of the polymer formed, i.e., polymethyl methacrylate (PMMA) or polystyrene, in terms of the molecular weight, the second virial coefficient, the radius of gyration, the translational diffusion coefficient and its corresponding equivalent hydrodynamic radius as well as estimated of the size (or molecular weight) distribution of the polymer in dilute solution; and in terms of the isothermal compressibility, the cooperative diffusion coefficient and a slow characteristic decay time which has sometimes been related to the self-diffusion coefficient in the semidilute solution regime. By combining a spectroscopic technique, such as Raman scattering, which can determine the polymer concentration non-evasively during the polymerization process, with laser light scattering, we have demonstrated a viable procedure for on-line monitoring of solution polymerization processes permitting us to investigate detailed macromolecular properties in solution polymerization kinetics. The same approach has been extended to examine the thermal polymerization of melt hexachlorocyclotriphosphazine and of hexachlorocyclotriphosphazene in 1,2,4-trichlorobenzene to form poly(dichlorophosphazene).

535,803
AD-A153 411/4 Not available NTIS
Louisiana State Univ., Baton Rouge. Dept. of Physics and Astronomy.
Electronic Structure of Some Heteronuclear Diatomic Molecules in the Local Spin Density Approximation,
S. Dhar, A. Ziegler, D. G. Kanhere, and J. Callaway. 15 Jan 85, 6p ARO-17235.3-PH
Contract DAAG29-81-K-0006
Availability: Pub. in Jnl. of Chemical Physics, v82 n2 p868-872, 15 Jan 85 (No copies furnished by DTIC/NTIS).

Ab initio self-consistent spin polarized calculations have been performed for the electronic structure of the heteronuclear diatomic molecules LiH, CO, and NO; using local spin density functional theory. The Kohn-Sham functions have been expanded in terms of a basis set of Gaussian orbitals. All the one and two electron integrals are calculated exactly. The matrix elements of the exchange correlation potential are computed numerically using a two dimensional doubling grid developed for this purpose. The total energy, the binding energy, the equilibrium distance, the vibrational frequency, and the dipole moment are reported and compared with experimental results and with other calculations. The agreement of our results with experimental values is very good in all cases.

535,804
AD-A153 423/9 Not available NTIS
Purdue Univ., Lafayette, IN. Richard B. Wetherill Lab.
Molecular Addition Compounds. 9. Effect of Structure on the Reactivities of Representative Borane-Amine Complexes in Typical Reactions Such as Hydrolysis, Hydroboration, and Reduction,
H. C. Brown, and L. T. Murray. 1984, 10p ARO-18776.11-CH
Contract DAAG29-82-K-0047
Availability: Pub. in Inorganic Chemistry, v23 n18 p2746-2753 1984 (No copies furnished by DTIC/NTIS).

A number of borana-amine complexes with widely different structural features in the amine portion was prepared and their reactivities toward typical B-H reactions, such as hydrolysis, hydroboration of 1-octene, and reduction of cyclohexaone, were studied. BH3-amine complexes containing an N-phenyl group are hydrolyzed by the neutral hydroxylic solvents, while others require a strong acid medium for the hydrolysis. In hydroboration, BH3-N-phenylamine complexes reduce cyclohexanone in THF at 25 C at reasonable rates, while others require acetic acid solvent or mineral or Lewis acids to achieve the desired reduction. Thus, among such borane-amine addition compounds, the BH3-N-phenylamines emerge as unique hydroborating and reducing agents, The results of the present study provide insights into the mechanisms of the hydroborating and reduction reactions. The rates of hydroboration of alkenes with BH3-amine complexes are inversely related to the stability of the adduct, arguing for a prior dissociation of the adduct, followed by the reaction of BH3 with the alkene.

535,805
AD-A153 429/6 Not available NTIS
Columbia Univ., New York. Dept. of Chemistry.
Fluorescence Probes for Aqueous Solutions of Nonionic Micelles,
N. J. Turro, and P. L. Kuo. 1985, 4p ARO-19800.6-CH
Contract DAAG29-83-K-0047
Availability: Pub. in Langmuir, v1 n1 p170-172 1985 (No copies furnished by DTIC/NTIS).

Three fluorescence probes, pyrenecarboxaldehyde (PA), pyrene (P), and an ionic indole labeled detergent (In), have been employed to investigate nonionic (Triton) micelles of varying EO number. PA serves as a probe of the surface of micelle, P serves as a probe of the inner layer of micelles, and In serves as a probe of the inner core of micelles. Measurement of fluorecence parameters for PA, P, and In as a function of variations of surfactant structure and temperature provides direct information of the time-averaged location of the probes in nonionic micelles and indirectly provides information on the nonionic micelles' structure.

535,806
AD-A153 431/2 Not available NTIS
Chemical Dynamics Corp., Columbus, OH.
Variational Transition State Theory,
D. G. Truhlar, and B. C. Garrett. 1984, 32p ARO-18172.21-CH-S
Contract DAAG29-81-C-0015
Availability: Pub. in Ann. Rev. Phys. Chem., v35 p159-189 1984 (No copies furnished by DTIC/NTIS).

Transition state theory (TST) is the most widely used theory for calculating rates of bimolecular reactions occurring in the gas phase and in condensed phases. TST is also incorporated into the widely used RRKM theory for unimolecular reactions. The popularity of TST is largely due to its simplicity and its usefulness for correlating trends in reaction rates in terms of easily interpreted quantities. Several forms of variational transition state theory (VTST) have been proposed, one as early as 1937; however, until recently, most applications of TST have been limited to the conventional (nonvariational) formulation.

535,807
AD-A153 443/7/GAR PC **A03/MF A01**
Utah Univ., Salt Lake City. Dept. of Chemistry.
Conversion of Smaller Borane Fragments to Larger Structures. Systematics of Boron Hydride Reactions.
Final rept. 19 Jun 81-31 Dec 84,
R. W. Parry, and G. Kodama. 31 Dec 84, 33p ARO-18151.14-CH
Contract DAAG29-81-K-0101
Continuation of Contracts DAAG29-76-G-0120 and DAAG29-79-C-0129.

The synthesis and reaction chemistry of B4H8 adducts of strong bases including trimethylphosphine, the boron framework expansion through the use of B2H4.2PMe3, the synthesis of polyboron cations including B3H6.2PMe3(*) and B4H7.2PMe3(+), and the coordinations chemistry of B2H4.2PMe3 are summarized. Described also are the synthesis of isomers of dichloroborylpentaborane(9), the reacion chemistry of B3H7PH3, anomalies in the reaction of B4H10 with bases, the deuteration of triborane adducts and the deprotonation of B5H9 with solid KOH.

535,808
AD-A153 449/4/GAR PC **A02/MF A01**
Aerodyne Research, Inc., Billerica, MA. Center for Chemical and Environmental Physics.
Gas-Phase Reaction Rate of Sodium Hydroxide with Hydrochloric Acid,
J. A. Silver, A. C. Stanton, M. S. Zahniser, and C. E. Kolb. 1984, 7p AFGL-TR-85-0061
Contracts F19628-83-C-0010, DAAG29-81-C-0024
Pub. in Jnl. of Physical Chemistry, v88 p3123-3129 1984.

The reactions of metallic species introduced into the atmosphere by meteor ablation may play a significant role in stratospheric chemistry. In particular, it has been suggested that the reaction of NaOH with HCl might affect the concentration of odd chlorine, thus having an impact on the ozone balance. This paper describes the first measurement for this reaction rate constant. At 308 K, we find that K= (2.8 + or = 0.9) x 10 to the minus 10 power molecule. As a result of the methods developed to perform this measurement, we have also determined estimates of the following room temperature rate constants in units of cc/molecule/s: k(MaO + HCl yield NaCl +OH) = 2.8 x 10 to the minus 10 power, k(NaOH + H yield Na + H20) 4 x 10 to the minus 12 power, k(NACl ; H yield Na + HCl) = 5 x 10 to the minus 14+ or -1 power, and k(Na + H202) = 6.9 X 10 to the minus 11 power, where approximately 0.6 of the reactions produce NaOH + OH, with the remainder forming NaO + H2O.

535,809
AD-A153 450/2 Not available NTIS
Purdue Univ., Lafayette, IN. Richard B. Wetherill Lab.
Selective Reduction of Disulfides to Thiols with Potassium Triisopropoxyborohydride,
H. C. Brown, B. Nazer, and J. S. Cha. Jun 84, 5p ARO-18776.9-CH
Contract DAAG29-82-K-0047
Availability: Pub. in Communications, p498-500 Jun 84 (No copies furnished by DTIC/NTIS).

Potassium triisopropoxyborohydride (2; KIPBH) is a mild reducing agent which readily reduces only the carbonyl group of aldehydes and ketones among the wide variety of functional groups examined. We now report that it readily reduces both aliphatic and aromatic disulfides to the corresponding thiols. Moreover, it selectively reduces aromatic disulfides in the presence of aliphatic disulfides, Consequently, it is now possible to reduce selectively disulfides in the presence of most functional groups. The sulfur-sulfur bond in disulfides plays an important role in biological activity. Hence, the conversion of the sulfur-sulfur bond in disulfides to thiols has been subjected to considerable study, This conversion can be achieved most easily by reduction.

535,810
AD-A153 462/7 Not available NTIS
Minnesota Univ., Minneapolis. Dept. of Aerospace Engineering and Mechanics.

Hyperbolicity and Change of Type in the Flow of Viscoelastic Fluids,
D. D. Joseph, M. Renardy, and J. C. Saut. 1985, 40p R-85-1, ARO-18878.20-MA
Contract DAAG29-82-K-0051
Availability: Pub. in Archive for Rational Mechanics and Analysis, v87 n3 p213-251 1985 (No copies furnished by DTIC/NTIS).

The equations governing the flow of viscoelastic liquids are classified according to the symbol of their differential operators. Propagation of singularities is discussed and conditions for a change of type are investigated. The vorticity equation for steady flow can change type when a critical condition involving speed and stresses is satisfied, This leads to a partitioning of the field of flow into subcritical and supercritical regions, as in the problem of transonic flow.

535,811
AD-A153 496/5 Not available NTIS
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
Oxidation of GaAs(110): New Results and Models,
G. Landgren, R. Ludeke, J. F. Morar, Y. Jugnet, and F. J. Himpsel. 15 Oct 84, 4p ARO-1930.3-EL
Contract DAAG29-83-C-0026
Availability: Pub. in Physical Review B, v30 n8 p4839-4841, 15 Oct 84 (No copies furnished by DTIC/NTIS).

The oxidation of ultrahigh-vacuum-cleaved GaAs(110) surfaces has been studied with high-resolution, core-level photoemission excited with synchrotron radiation. The oxidation is spatially and chemically inhomogeneous, and both subsurface oxidation and multibonding geometries occur already at submonolayer coverages.

535,812
AD-A153 497/3 Not available NTIS
Purdue Univ., Lafayette, IN. Richard B. Wetherill Lab.
Selective Reductions. 36. Reaction of Lithium 9-Boratabicyclo(3.3.1)Nonane with Selected Organic Compounds Containing Representative Functional Groups,
H. C. Brown, C. P.Mathew, C. Pyun, J. C. Son, and N. M. Yoon. 1984, 9p ARO-18776.12-Ch
Contracts DAAG29-82-K-0047, DAAG29-79-C-0027
Availability: Pub. in Jnl. of Organic Chemistry, v49 n17 p3091-3097 1984 (No copies furnished by DTIC/NTIS).

The approximate rates, stoichiometry, and products of the reaction of lithium 9-boratabicyclo(3.3.1) nonane with selected organic compounds containing representative functional groups were examined under standard conditions (tetrahydrofuran, room temperature) in order to explore the reducing characteristics of this reagent and to establish the utility of the reagent as a selective reducing agent. The reactivity of various functional groups toward the reagent can be classified into four broad categories, as follows: 1) rapid or fast reduction-alhdehyde, ketone, ester, lactone, alkyl chloride, acid anhydride, epoxide, disulfide, n-alkyl iodide, and tosylate; 2) slow reduction- tertiary amide, alkyl bromide and aromatic nitrile; 3) sluggish reduction- carboxylic acid, aliphatic nitrile, primary amide, nitro and azoxy compound, and secondary alkyl bromide and tosylate; 4) inert-olefin, oxime, alkyl chloride, sulfoxide, azo-compound, sulfide, sulfone, and sulfonic acid.

535,813
AD-A153 498/1 Not available NTIS
Purdue Univ., Lafayette, IN. Richard B. Wetherill Lab.
Selective Reductions. 35. Reaction of Representative Organic Functional Groups with Lithium Borohydride in the Presence of B-Methoxy-9-Borabicyclo(3.3.1)Nonane. A Simple, Convenient Procedure for the Catalyzed Selective Reduction of Esters,
H. C. Brown, and S. Narasimhan. 1984, 10p ARO-18776.14-CH
See also AD-A153 497.
Distribution limited to The Jnl. of Organic Chemistry, v49 n21 p3891-3898 1984 (No copies furnished by DTIC/NTIS).

The rate of reduction of esters by lithium borohydride is considerably enhanced by a number of Lewis acids of boron. The remarkable catalytic effect of B-MeO-9-BBN and (MeO)3B in enhancing the reactivity of lithium borohydride toward the reduction of other representative functional groups has been explored. Alkyl halides are not reduced. Epoxides are readily reduced in 0.25 h. Carboxylic acids are reduced rapidly up to 50%, with further reaction being very slow. Acid salts are not reduced. Tertiary amides are slowly reduced in the presence of 100 mol % of B-zMeO-9-BBn, 40% in 24 h. Nitriles, under the same conditions, are reduced completely in 5H. Pyridine and nitrobenzene are not significantly affcted by this system. Sulfides, sulfoxides, and sulfones are also inert. However, tosylates are reduced rapidly. These results indicate the utility of this catalytic effect for the ready reduction of esters by lithium borohydride, as well as the ability of this reducing system to tolerate many substituents in such reductions.

535,814
AD-A153 499/9/GAR PC **A02/MF A01**
Purdue Univ., Lafayette, IN.
Super Hydrides.
Final rept. 1 Feb 82-31 Jan 85,
H. C. Brown. 7 Mar 85, 22p ARO-18776.21-CH
Contract DAAG29-82-K-0047

The unusual reactivity of lithium triethylborohydride (Super Hydride) encouraged us to examine the selective reduction properties of a number of new reducing agents. Just as the replacement of hydrogen atoms in lithium borohydride (LiBH4) with alkyl groups increases the reactivity of the reagent, substitution with alkoxy groups diminishes the reactivity. Thus, the trialkoxyborohydrides (K (RO)3BH) are very mild reducing agents. A series of potassium trialkoxyborohydrides were prepared in refluxing tetrahydrofuran from the trialkoxyborane and potassium hydride. In a similar fashion, a number of monoalkyldialkoxyborohydrides (KR (OR)2BH) were prepared from cyclic boronate esters and potassium hydride. We also discovered that potassium hydride reacts readily with a variety of B-alkoxy-9-BBN derivatives to afford the corresponding potassium dialkylalkoxyborohydrides (KR(OR)2BH). Thus we can now prepare the entire series of alkylalkoxyborohydrides: KR3Bh, KR2(OR)BH, KR(OR)2BH and K(OR)3BH. Although the full potentialities of these reagents are yet to be explored, preliminary studies on the reduction of cyclic ketones have shown encouraging stereoselectivities.

535,815
AD-A153 505/3/GAR PC **A03/MF A01**
Minnesota Univ., Minneapolis. Dept. of Aeronautics and Engineering Mechanics.
Theoretical and Experimental Studies of the Mechanics of Viscoelastic Liquids.
Final rept. 10 Jan 82-9 Jan 85,
D. D. Joseph, and G. S. Beavers. 15 Feb 85, 37p ARO-18878.37-MA
Contract DAAG29-82-K-0051

Theoretical and experimental studies of a wide range of problems in the rheometry of viscoelastic fluids are described. A device to measure the shear relaxation function has been invented (the wave speed meter). Investigations of the conditions under which the equations for the flow of viscoelastic liquids can change type have been carried out. The results from experiments and analyses on a variety of problems associated with bicomposed flows of liquids with different viscosities are presented. These included liquid rollers, the flow of two liquids in a pipe, and Taylor instability with two immiscible liquids. Analysis and experiments of the motion of a viscoelastic liquid between eccentric rotating cylinders are described. Some analytical results for the extrudate swell problem are presented. The climbing constants for a wide range of viscoelastic liquids have been measured. Other projects include stability analyses for several flow geometries; experiments on viscoelastic liquid breakup; and experiments on the stability of a rotating and coning cylinder. Keywords include: Rheology; Viscoelastic liquids; Wave speed meter; Discontinuities; Hyperbolicity; Change of type; Bicomponent flows; Rotating cylinders; Liquid rollers; Jets; Die swell; Liquid breakup; Climbing constants; Fading memory; Instabilities; Coning cylinder.

535,816
AD-A153 507/9 Not available NTIS
Cornell Univ., Ithaca, NY. Dept. of Chemistry.
Reactions of Metastable (C5H10)+. Ions with the Oxygen on the Second Carbon,
D. J. McAdoo, F. W. McLafferty, C. E. Hudson, and T. E. Parks. 1984, 12p ARO-19107.17-CH
Contract DAAG29-82-K-0179
Availability: Pub. in Organic Mass Spectrometry, v19 n8 p353-362 1984 (No copies furnished by DTIC/NTIS).

Nearly all (C5H10O)(+.) isomers with the oxygen on the second carbon are shown to interconvert with each other and lose methyl and ethylene at the threshold for dissociation. The methyls contain the carbons from the 1- and 5-positions with about equal frequency, and C(3) or perhaps C(4) about as half as often as either terminal carbon. CH3CH2CH2CO(+) is formed by the loss of the C(1) methyl and CH2=CHC(=O(+)H)CH3 by loss of the C(5) methyl. Hydrogen transfer between C(5) and the oxygen and between the oxygen and C(4) are facile, and 1,2-hydrogen transfers between C(3) and C(4) occur with high frequency. Extensive skeletal rearrangements also take place by 1,2-shifts between C(2), C(3) and C(4). We attribute the occurrence of the three-center shifts between C(2), C(3) and C(4) to the presence of considerable charge density on C(2) and C(3) in many of the (C5H10O(+.) isomers. The isomerizations of (C5H10O(+.) can be considered a mixture of free radical and carbocation reactions. Strong similarities exist between the isomerizations of metastable (C5H10(+.) ions with the oxygen on the second carbon and those of isomers of ionized butanoic acid, methyl butanoate and N-butanal. Keywords include: Mass spectroscopy, Metastable ions, and Unimolecular ion dissociations.

535,817
AD-A153 547/5/GAR PC **A02/MF A01**
Texas Univ. at Austin. Dept. of Chemistry.
Electrogenerated Chemiluminescence.
Final rept. 15 Oct 81-14 Oct 84,
A. J. Bard. Dec 84, 8p ARO-18404.6-CH
Contract DAAG29-82-K-0006

Investigations of the chemiluminescent reactions of electrogenerated species (ecl) are summarized in the final technical report. We have become interested in polymer electrodes and in the possibility of studying electron-transfer reactions and ion transport in polymers by utilizing ecl techniques. We have recently reported the ecl of Ru(bpy)3 (2+) (bpy=2,2'-bipyridine) incorporated into a Nafion polymer film on an electrode surface. The electrochemical behavior and ecl of Ru(bpz) 2; (bpz-3(2+) (bpz=2,2'-bipyrazine) in acetonitrile solution have been investigated. Luminescence at Semiconductor Electrodes and Colloidal Dispersions are reported. Photoluminescence (pl) and photoinduced oxygen adsorption of colloidal zinc sulfide dispersions have been studied. Pl and electroluminescence (el) on ZnS single crystals and polycrystals doped with different impurities have been studied in various media (air, aqueous or nonaqueous solutions containing various redox couples).

535,818
AD-A153 627/5/GAR PC **A02/MF A01**
Naval Research Lab., Washington, DC.
Localized Ionic Currents from a Corroding Iron-Copper Galvanic Couple.
Progress rept. Jan-Jul 84,
C. R. Crowe. 18 Apr 85, 23p Rept no. NRL-MR-5416

In this report, progress in the application and development of scanning vibrating electrode techniques (SVET) for electrochemical measurements needed to test finite element models is presented. The test system is an iron-copper galvanic couple in which SVET have been used to measure local ionic currents in solution with spatial and current resolutions of the order of 15 to 20 micron and 5nA/sq cm, respectively. Thus, it is possible to measure corrosion currents resulting from individual local cell activity on a scale sufficient to test finite element models for accuracy. The report covers a) a review of the state-of-the-art of scanning vibrating probe techniques, b) an experimental evaluation of the one-dimensional probe technique as applied to planar galvanic couple between iron and copper, and c) a discussion of the development of a three-dimensional probe to advance the state-of-the-art. Based on the completed experimental electric field scans and the corresponding finite element field prediction, it appears that the finite element technique presents a strong analytical tool for calculating the near field distributions about active electrodes surfaces in homogeneous media.

535,819
AD-A153 650/7/GAR PC **A04/MF A01**
Technische Hochschule Darmstadt (Germany, F.R.). Inst. fuer Hochfrequenztechnik.

Micro-Reactions of Metal Contacts on Various Types of GaAs Surfaces.
Annual rept. no. 2, Jan 84-Jan 85,
H. L. Hartnagel, K. H. Kretschmer, B. R. Sethi, and J. Wuerfl. Jan 85, 59p
Contract DAJA45-83-C-0012

Further XPS analysis results of a range of GaAs surfaces are reported which are produced by various technological steps such as etching in basic or acidic solutions as customary before the deposition of metals. The findings of lateral material transport between co-planar electrodes, on Metal-GaAs interdiffusion due to typical operational device conditions and on the electron wind in narrow conductors are presented.

535,820
AD-A153 653/1/GAR PC **A04/MF A01**
Army Ballistic Research Lab., Aberdeen Proving Ground, MD.
Evaluation of Colorimetric Analysis for Chemical Agent Resistant Coating (CARC) Testing.
Memorandum rept.,
B. A. Bodt, and J. Thomas. Feb 85, 52p BRL-MR-3434, SBI-AD-F300 606

The Physical Protection Directorate (PPD) of the Chemical Research and Development Command (CRDC) requested that the Ballistic Research Laboratory (BRL) provide statistical assistance in designing tests to identify sources of variation in agent resistance testing. The first experiment was designed to determine accuracy, precision, and also variation due to operator, produced by the colorimetric analysis of agents. Two agents were considered in the tests, HD and GD. Results showed the PPD test to be precise for HD and marginally precise for GD. The experiment was inconclusive regarding accuracy and operator variation. This was due to unexpected and unaccounted for test conditions. Details of these unexpected conditions and their effect on conclusions are included. Recommendations are given for future work which could enable experimenters to obtain more meaningful results, regarding accuracy and precision, from the experiment already performed.

535,821
AD-A153 665/5/GAR PC **A03/MF A01**
Rochester Univ., NY. Dept. of Chemistry.
Laser-Stimulated Vibrational Excitation of an Adspecies Studied by a Generalized Master Equation: Neutral Atomic Hydrogen on Hydrated KCl(001).
Interim technical rept.,
A. C. Beri, and T. F. George. Apr 85, 27p Rept no. UROCHESTER/DC/85/TR-62
Contract N00014-80-C-0472

Vibrational energy transfer between an IR laser, a solid surface and an adatom is studied by a generalized master equation which includes memory effects. Numerical problems associated with the temporally delocalized memory kernel are overcome by introducing the isomnesic approximation. Results obtained for time scales ranging from 2 ps to 2 micro s for H(H2O)/KC1(001) show that effective vibrational excitation is possible with low power lasers (1 W/sq cm) in spite of fast phonon relaxation. Detailed time-evolution of the system is seen to differ radically from that predicted by Markovian theories, even for fairly long time scales.

535,822
AD-A153 672/1 Not available NTIS
McGill Univ., Montreal (Quebec). Dept. of Chemistry.
Ion Clustering in Styrene-Based Ionomers. Calorimetric and Gravimetric Hydration Studies and Effect of Ion Concentration and Thermal History,
M. Escoubes, M. Pineri, S. Gauthier, and A. Eisenberg. 1984, 19p ARO-17438.6-CH
Contract DAAG29-80-C-0144
Availability: Pub. in Jnl. of Applied Polymer Science, v29 p1249-1266 1984 (No copies furnished by DTIC/NTIS).

The water sorption behavior of styrene-methacrylic acid copolymers and of their sodium salts has been studied as a function of concentration of ionic groups and nature of the sample. The influence of thermal history has also been examined. The salt forms of the copolymers were found to have a greater hydration capacity than the acids, the hydration capacity increasing with ion content for the salts. The hydration energy of the acid forms was found to be in the vicinity of the liquefaction energy of water whereas the energy for the salt forms became much lower than that value, with increasing water content. This decrease in energy has been attributed to a rearrangement of the cluster structure to accommodate more water molecules.

535,823
AD-A153 673/9 Not available NTIS
Cornell Univ., Ithaca, NY.
Dynamics of Molecular Two-Photon Excitation through Real Intermediate States,
L. Biglo, and E. R. Grant. 1984, 9p ARO-19923.6-CH
Contract DAAG29-83-K-0020
Availability: Pub. in Israel Jnl. of Chemistry, v24 p251-258 1984 (No copies furnished by DTIC/NTIS).

New results from our laboratory on the two-photon absorption spectroscopy and photodissociation dynamics of NO2 are examined in the light of a simple nonperturbative theory for the time evolution of the intermediate state in a three-level system. Experiments on NO2 show effects distinct to two-photon excitation, evident spectroscopically in intense bent-to-linear origins and dynamically in unique patterns of energy disposal in two-photon photodissociation. We trace these effects to intramolecular relaxation which can be described by the evolution of an intermediate wave packet composed of a superposition of vibronic states prepared by the absorption of the first photon. Our theoretical treatment addresses the timescale for this evolution. Its results suggest that this timescale will depend on the intensity of the driving field, and so offer the intriguing possibility that the spectroscopy and dynamics of two-photon excitation through a system of real states will depend on laser intensity in a manner that tracks the time dependence of the intermediate wave packet.

535,824
AD-A153 736/4/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Laser Remote Sensing of Hydrazine, MMH (Monomethylhydrazine), and UDMH (Unsymmetrical Dimethylhydrazine) Using a Differential-Absorption CO2 Lidar.
Journal article,
N. Menyuk, D. K. Killinger, and W. E. DeFeo. 15 Jun 82, 13p JA-5314, ESD-TR-85-062
Contract F19628-80-C-0002
Pub. in Applied Optics, v21 n12 p2275-2286, 15 Jun 82.

A dual min-TEA CO2 laser differential-absorption lidar system has been used to test the remote sensing of hydrazine, unsymmetrical dimethylhydrazine (UDMH), and monomethylhydrazine (MMH) in atmospheric conditions. Average concentrations of these compounds were measured using backscattered laser radiation from a target located at a range of 2.7 km. The experimental results indicate that average atmospheric concentration levels of the hydrazine compounds of the order of 40-100 ppb can be detected over ranges between 0.5 and 5 km. The level of concentration sensitivity over this interval was found to be limited primarily by atmospheric fluctuations. An investigation of the effect of these fluctuations on measurement uncertainties indicated that the fluctuations reduce the benefits of signal averaging over N pulses significantly below the expected square root of N improvement. It is also shown that uncertainties due to long-term atmospheric drifts can be effectively reduced through use of dual-laser lidar return ratios.

535,825
AD-A153 756/2/GAR PC **A02/MF A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Thermodynamics of Homonuclear Diatomic Fluids from the Angular Median Potential,
D. MacGowan, E. M. Waisman, J. L. Lebowitz, and J. K. Percus. 15 Mar 84, 10p AFOSR-TR-85-0356
Grant AFOSR-82-0016
Pub. in Jnl. of Chemical Physics v80 n6 p2719-2726, 15 Mar 84. Prepared in cooperation with S-Cubed, La Jolla, CA, F49620-83-C-0022.

The use of the angular median potential as a temperature-independent spherical reference system for approximating molecular fluids is tested for its prediction of thermodynamics. Calculations have been carried out for a wide range of homonuclear diatomics with continuous atom-atom potentials believed to be representative of the full range of simulation data available for such systems. The results of the pressure are surprisingly good both in the denotation regime and around the triple point. In the latter case, however, the internal energies for highly elongated molecules with attractive potential wells are considerably too positive. Comparison with other perturbation theories indicates that the median reference system gives better pressures but poorer energies than RAM, and that in many cases, especially for purely repulsive potentials, it gives results of comparable accuracy to those obtained with nonspherical reference systems.

535,826
AD-A153 769/5/GAR PC **A02/MF A01**
Rochester Univ., NY. Dept. of Chemistry.
Quantum Model of Dephasing-Enhanced Laser Desorption: Master Equation Approach.
Interim technical rept.,
J. T. Lin, X. Y. Huang, and T. F. George. Apr 85, 24p Rept no. UROCHESTER/DC/85/TR-61
Contract N00014-80-C-0472

A new model for laser-induced desorption is proposed based on a master equation for the photon population in a closely-couple subsystem involving the relevant degrees of freedom. The validity of approximations such as the Born and Markovian approximations is discussed in terms of the laser pulse duration and multiple time scales of the adspecies-surface system. The desorption rate is numerically calculated from the photon population and the threshold number of photons absorbed by the adspecies. The effects of anharmonicity, dephasing and laser detuning on the desorption rate are examined. The mechanism of dephasing and the possible direct and indirect desorption channels are discussed.

535,827
AD-A153 816/4/GAR PC **A02/MF A01**
Stanford Univ., CA. Dept. of Chemistry.
Effect of Internal and Translational Energy on the NH3(+)(V) + D2 Ion-Molecule Reaction,
R. J. S. Morrison, W. E. Conaway, and R. N. Zare. 1 Feb 85, 8p AFOSR-TR-85-0399
Contract F49620-83-C-0033
Pub. in Chemical Physics Letters, v113 n5 p435-440, 1 Feb 85.

Using 2+ multiphoton ionization, NH3(+) is prepared in selected levels of the v2 bending mode (v=0-7) and the NH(+) + D2 reaction is studied as a function of the center-of-mass collision energy (1-10 eV). The exchange channel (NH2D+HD or H + D) is enhanced by ion vibrational excitation whereas the addition channel (NH3D+ +D) is almost unaffected.

535,828
AD-A153 836/2/GAR PC **A02/MF A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
One Molecular Fluid Approximation for Diatomic Fluid Mixtures,
E. M. Waisman, J. L. Lebowitz, and D. MacGowan. 15 Dec 84, 8p AFOSR-TR-85-0357
Grant AFOSR-82-0016
Pub. in Jnl. of Chemical Physics, v81 n12 pt.2 p6096-6099, 15 Dec 84.

We investigate a one component molecular fluid approximation for conformally similar molecules. We test this scheme on (two) mixtures of rigid homonuclear diatomic Lennard-Jones (LJ) fluids for which a limited amount of information from molecular dynamics simulations is available. For two components of approximately equal bond length but different LJ parameters our results compare favorably with the machine computations. From the very few simulation data available for equimolar mixtures of molecules differing only in their bond lengths we cannot reach any firm conclusion. Alternative procedures for treating general molecular fluid mixtures are discussed.

535,829
AD-A153 838/8/GAR PC **A02/MF A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Equivalent Potentials for Equations of State for Fluids of Nonspherical Molecules,
G. O. Williams, J. L. Lebowitz, and J. K. Percus. 15 Aug 84, 7p AFOSR-TR-85-0354
Grant AFOSR-82-0016
Pub. in Jnl. of Chemical Physics, v81 n4 p2070-2075, 15 Aug 84.

This investigation analyzes the extent to which the equation of state and other thermodynamic properties of systems of hard nonspherical molecules can be obtained from a density independent hard sphere refer-

ence system. It is concluded that the median and Barker-Henderson prescriptions effectively reproduce all data now available. The motivation for these two formulations is discussed in detail.

535,830
AD-A153 842/0/GAR PC **A03**/MF **A01**
United Technologies Research Center, East Hartford, CT.
Resonant CARS Detection of OH Radicals.
Final rept. 1 Aug 81-31 Dec 84,
J. F. Verdieck, R. J. Hall, and A. C. Eckbreth. 31 Jan 85, 48p UTRC/R85-955655, AFOSR-TR-85-0385
Contract F49620-81-C-0063

Under this AFOSR contract, resonant CARS (Coherent Anti-Stokes Raman Spectroscopy) of OH has been observed for the first time. Resonant CARS was achieved for several electronic transitions in the ultraviolet A--X bands of OH in a methane/oxygen flame. Saturation of the resonant CARS spectrum of OH was examined experimentally and definite evidence found, both in the intensity variation, and the number and shapes of the lines. Concurrently with the experimental studies, a good understanding of the theoretical aspects of the resonant CARS process has been secured, to the extent that predicted resonant CARS spectra can be computer synthesized and graphed for any selected frequency. A major departure from theoretical predictions was the experimental observation of satellite lines about the central line, not predicted from theory. At present, the cause of these extra resonances has not been determined, but their appearance may arise from saturation effects, or be caused by an undetermined nonlinear optical effect (such as dephasing--nduced coherences). Another contributing factor may be rotational energy level transfer bought about by collision processes, occurring within the duration of the 10 nanosecond laser phase.

535,831
AD-A153 846/1/GAR PC **A02**/MF **A01**
Florida Univ., Gainesville. Dept. of Chemistry.
Laser-Induced Intermodulated Flame Fluorescence: A New Approach to Scattering Correction in Analytical Atomic Fluorescence,
N. Omenetto, L. P. Hart, and J. D. Winefordner. 1984, 18p AFOSR-TR-85-0410
Contract F49620-80-C-0005
Pub. in Applied Spectroscopy, v38 n5 p619-624 1984.

It is shown that the technique of intermodulated fluorescence can effectively correct for scattering problems in analytical flame fluorescence spectroscopy. When two laser beams, amplitude-modulated at different frequencies f sub 1 and f sub 2 and counterpropagated colinearly throughout an atomizer, are tuned to the absorption transition of the element of interest, non-linear mixing of the fluorescence signal results, due to saturation effects. By extraction of the signal at the sum or difference frequency, f sub 2 + or - f sub 2, the linear scattering component of the spectrum can be essentially eliminated. This has been demonstrated for a sodium solution nebulized in a premixed, laminar, argon-oxygen-hydrogen flame. Because the modulation signal can be observed only at the intersection volume between the two beams, this technique constitutes a powerful tool for spatially resolved combustion diagnostics.

535,832
AD-A153 864/4/GAR PC **A02**/MF **A01**
Rochester Univ., NY. Dept. of Chemistry.
Role of Phonons in the Excitation and Relaxation of Adspecies,
A. C. Beri, K. T. Lee, and T. F. George. 16 Dec 83, 10p 57, AFOSR-TR-85-0363
Grant AFOSR-82-0046
Pub. in Proceedings of the International Conference on Lasers, p362-369, 12-16 Dec 83.

The IR laser excitation of an adbond is studied by both a quantum mechanical generalized master equation approach and a classical generalized Langevin approach. The role of phonons in the energy flow between the adbond and the surface is considered. The latter approach looks further at local heating via direct excitation of surface atoms. It is seen that the Markovian approximation is in general inadequate, and the local heating is an important mechanism for desorption.

535,833
AD-A153 867/7/GAR PC **A02**/MF **A01**
California Univ., Santa Barbara. Dept. of Chemistry.
Preparation of Well-Defined Surfaces at Atmospheric Pressure: Studies by Electrochemistry and LEED of Pt(100) Pretreated with Iodine,
A. Wieckowski, S. D. Rosasco, B. C. Schardt, J. L. Stickney, and A. T. Hubbard. 1984, 6p AFOSR-TR-85-0364
Grant AFOSR-81-0149
Pub. in Inorganic Chemistry, v23 n5 p565-569 1984.

Reported here are studies by LEED, Auger spectroscopy, and electrochemistry which show that Pt(100) monocrystal surfaces purposely disordered by electrochemical oxidation and reduction (as in the procedure commonly employed to clean or activate Pt electrodes) are restored to an ordered state by programmed heating under an Ar atmosphere containing iodine vapor. A nearly hexagonal, centered-rectangular adlattice of I atoms was formed, containing three I and five Pt atoms in the surface unit cell. Programmed heating of this adlattice led to stepwise desorption of halogen and produced a series of related adlattices. One of these is particularly amenable to identification, without LEED, by means of its characteristic cyclic voltammogram for silver electrodeposition. The behavior of each iodine adlattice toward silver electrodeposition and programmed temperature desorption is reported. These atmospheric iodine pretreatment and voltammetric procedures for preparing and verifying a well-defined electrode surface do not require vacuum equipment, although demonstration of the ordered structures in this work employed LEED and related techniques under ultrahigh vacuum. This basic approach should be applicable to a wide range of metals and adsorbates.

535,834
AD-A153 889/1/GAR PC **A02**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Spherical Reference Systems for Nonspherical Hard Interactions,
G. O. Williams, J. L. Lebowitz, and J. K. Percus. 1984, 6p AFOSR-TR-85-0353
Grant AFOSR-82-0016
Pub. in Jnl. of Physical Chemistry, v88 n26 p6488-6489 1984.

We investigate the applicability of the median and Barker-Henderson prescriptions for obtaining spherical reference systems for three models: hard linear triatomics, hard heteronuclear dumbbells, and two-component mixtures of hard dumbbells, We propose an empirical method for determining the median potential for systems lacking a high degree of symmetry. For mixtures of hard molecules, we find that both the median and Barker-Henderson prescriptions give rise to approximately additive hard-sphere reference potentials.

535,835
AD-A153 891/7/GAR PC **A05**/MF **A01**
Salford Univ. (England).
Spray Pyrolysis as a Synthetic Tool.
Final technical rept.,
O. Meth-Cohn, D. Patel, and R. K. Smalley. Nov 84, 87p
Contract DAJA37-81-C-0763

The project is concerned mainly with the solution thermolysis and spray vacuum pyrolysis (SVP) of acyl and aryl azides. Under the latter conditions alkyl azidoformates (Ar(CH2)nOCON3; n = 1 or 2) yield 5:7 or 6:7 fused 1H-azepines. The majority of the 5:7 fused systems are unstable and undergo rapid (6 + 4) dimerisation. In contrast, the 6:7 fused systems are stable; the difference in stability is discussed in terms of the hybridisation of the bridgehead nitrogen. Attempts to trap aryl nitrenes intramolecularly by suitably placed OH and NH2 groups have failed. However, some novel polyheterocyclic structures have been obtained from the photo- and thermal decomposition of beta-hydroxyethyl o-azido-benzoate. The thermal decomposition of aryl azides in phenyl isocyanate yields 1-phenyl-3-phenylcarbamoyl-2-oxobenzimidazoles. In some cases N-arylcarbamates (p-XC6H4NHCO2Me) are produced. The mechanism of this surprising reaction is discussed. The behaviour of C-(o-azidobenzoyl) derivatives of alkyl ketones and esters on thermolysis and SVP is unpredictable and leads to a variety of heterocyclic products, dominant amongst which are 2,2-disubstituted indoxyls and 2,1-benz-isoxazoles. Anomolous behaviour is shown by o-azidobenzoyl malononitrile which on thermolysis yields a tetrazoloquinolone. The mechanisms of these reactions are discussed.

535,836
AD-A153 912/1/GAR PC **A02**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
Cage Effect in the Dissociation of Van der Waals Complexes RgI2(Rg=Ar,Kr,Xe). A Quasiclassical Trajectory Study,
I. NoorBatcha, L. M. Raff, and D. L. Thompson. 15 Dec 84, 11p AFOSR-TR-85-0414
Grant AFOSR-82-0311
Pub. in Journal of Chemical Physics, v81 n12 pt1 p5658-5665, 15 Dec 84.

This dissociation dynamics of the RgI2(Rg - Ar,Kr,Xe) Van der Waals complexes have been studied using three-dimensional quasiclassical trajectories. Specifically, the unimolecular dissociation of RgI2(B superscript 3 pi) with initial I2 vibrational excitation abcve the Rg+I+I dissociation limit of the B superscript 3 pi state was studied. In addition to complete dissociation to atoms, iodine recombination was observed to be a major reaction channel. This results is interpreted as a cage-like effect due to the inert gas atom, which also carries away a large fraction of the energy when the complex dissociates to from I2. The reaction mechanism leading to the formation of molecular products has been found to involve both direct and long-lived, complex trajectories. Dissociation of the complex RgI2 is favored by near collinear orientations. The decomposition kinetics of the complex are found to be complex and non-RRKM in character. A four-step reaction mechanism involving an explicit intramolecular energy transfer step is proposed to explain the calculated time dependence of the product concentrations. The calculated product vibrational distributions are in qualitative agreement with the experimental results.

535,837
AD-A153 932/9/GAR PC **A02**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Monte Carlo Simulation of Hard Spheroids,
J. W. Perram, M. S. Wertheim, J. L. Lebowitz, and G. O. Williams. 16 Mar 84, 5p AFOSR-TR-85-0360
Contract DE-ACO2-76ERO3077, Grant AFOSR-82-0016
Pub. in Chemical Physics Letters, v105 n3 p277-280, 16 Mar 84.

We present Monte Carlo simulations of the equation of state and radial distribution function for a mode fluid composed of hard spheroids. Keywords include: Hard spheroids; Monte Carlo Simulations; Equation of state; and Radial distribution function.

535,838
AD-A153 962/6/GAR PC **A02**/MF **A01**
Florida Univ., Gainesville. Dept. of Chemistry.
Laser-Excited Atomic Fluorescence in a Pulsed Glow Discharge,
B. W. Smith, N. Omenetto, and J. D. Winefordner. 1984, 6p AFOSR-TR-85-0411
Contract F49620-84-C-0002
Pub. in Spectrochimica Acta B, v39B n9-11 p1389-1393 1984.

A pulsed demountable glow discharge has been used as an atom cell for laser excited atomic fluorescence. Lead atoms are sputtered from the surface of copper and graphite cathodes and are excited by a pulsed frequency-doubled dye laser after the discharge is switched off. The combination of a 'dark' atom cell with non-resonance atomic fluorescence leads to a very low background signal. The detection limit for lead is 0.1 micro g/g and for lead in aqueous solutions (5 micro l) deposited on graphite electrodes is 20 pg.

535,839
AD-A153 968/3/GAR PC **A02**/MF **A01**
Stanford Univ., CA. Dept. of Chemistry.
Vibrational State Selection of Ammonia Ions Using Resonant 2 + 1 Multiphoton Ionization,
W. E. Conaway, R. J. S. Morrison, and R. N. Zare. 1 Feb 85, 8p AFOSR-TR-85-0406
Contract F49620-83-C-0033
Pub. in Chemical Physics Letters, v113 n5 p429-434, 1 Feb 85.

Photoelectron kinetic energy spectra are presented for the 2 + 1 multiphoton ionization of NH3 via the vibronic levels of the B and C' Rydberg states of the neutral. The contribution from delta v= 0 state-selected ionization is greater than 80% through the C' state and over 70% through the B state. This allows for the

production of large densities of NH3(+) ions with a high degree of vibrational selectivity.

535,840

DE85008546/GAR PC **A02**/MF **A01**
Tennessee Technological Univ., Cookeville. Dept. of Chemistry.
Synergistic Extraction Studies of Trivalent Actinides and Lanthanides Using Crabs, Crowns, and Cryptands.
D. D. Ensor, and A. H. Shah. 1984, 6p DOE/ER/10489-20, CONF-841210-21
Contract AS05-79ER10489
International chemical congress of Pacific Basin Society, Honolulu, HI, USA, 16 Dec 1984.

This report will describe the investigations of the synergistic characteristics of the novel neutral oxygen donors 1,13-bis-(quinolyl)-1,4,7,10,13-pentaoxotridecane (K-5), a crab; 4-tert-butylcyclohexo-15crown-5(15-C-5), a crown; and 5,6,14,15-dibenzo-4,7,13,16,21,24-hexaoxo-1,10-diazabicyclo(8,8,8)-hexacosane (222BB), a cryptate, for trivalent lanthanides and actinides in combination with HTTA. 3 references, 2 tables. (ERA citation 10:022928)

535,841

DE85008571/GAR PC **A02**/MF **A01**
Nevada Univ., Reno.
Photophysical Studies of Triplet Exciton Processes in Pure Polymer Films. Technical Progress Report, July 28, 1984-February 15, 1985.
R. D. Burkhart. 1985, 20p DOE/ER/45107-1
Contract FC08-84ER45107

The major objective of the work being carried out on this project is the reliable determination of the speed and migratory range of triplet excitons in pure polymer films. To achieve this objective, the work has been partitioned into two broadly defined subdivisions. These involve the development of experimental methods on the one hand and the determination of suitable polymer substrates on the other. Under the heading of methods development, the most important one is the project involving high intensity laser excitation followed by transient absorption. A system based on an XeCl excimer laser has been constructed and tested on a monomeric system 1,2-benzanthracene (BNZ). A second method being investigated involves the preparation of polymers having terminal groups specifically tailored for energy absorption at one end, energy emission at the other end and triplet exciton conduction between the two. Several polystyrene samples having terminal acetophenone-like units (the unique absorber) and naphthalene units (the emitter) have been prepared and are currently under study. A third area of study involving methods is associated with the kinetics of inter-versus intramolecular exciton migration in polymer solutions. (ERA citation 10:022944)

535,842

DE85008670/GAR PC **A02**/MF **A01**
California Univ., Berkeley. Dept. of Materials Science and Mineral Engineering.
Diffusion of Gases in Porous Solids - Simulation and Measurements. Tenth Quarterly Progress Report, October 16, 1984-January 15, 1985.
J. W. Evans. 1985, 4p DOE/PC/50796-T8
Contract FG22-82PC50796

Progress has been made on the theoretical aspects of this research. A number of Monte Carlo simulations for ordinary gas diffusion in Swiss cheese solids have now been completed. The results are plotted in the attached figure along with results for simulations of diffusion in cannonball solids which were included in last month's report. Also included in this figure are classical theoretical curves for transport in heterogeneous media. The results of the Monte Carlo simulations agree well with the classical theories. It should be noted that the simulation results and the classical theories are at odds with two frequently used correlations for the tortuosity factor, T, purporting to represent gaseous diffusion in porous solids: T = 1/E, where E = porosity and T = 1/E exp 2 . 1 figure. (ERA citation 10:022940)

535,843

DE85009041/GAR PC **A03**/MF **A01**
Tennessee Technological Univ., Cookeville. Dept. of Chemistry.
Investigation of the Solution Properties of the Transuranium Elements. Final Report, July 1, 1979-September 30, 1984.
D. D. Ensor. 1984, 32p DOE/ER/10489-21
Contract AS05-79ER10489
Portions of this document are illegible in microfiche products.

This final report summarizes the significant results obtained during our investigation of the fundamental solution properties of the transuranium elements for the period July 1, 1979 to September 30, 1984. Primary interest of the project was the development of improved separation methods for the trivalent actinide elements from each other and from the chemically similar trivalent lanthanide elements using solvent extraction techniques. Two different synergistic systems were investigated. The combination of dialkynaphthalenesulfonic acids with a crown ether or an oxime was an attempt to combine the excellent ion exchange properties of the sulfonic extractant with a synergistic agent which would improve the selectivity of the extraction system. The results showed that the presence of the crown ether improved the extraction of the light lanthanides by approximately 50% while the heavy lanthanides were unaffected. The use of the oxime in combination with the sulfonic acid extractant showed significant enhancement for all metal ions studied but little, if any, selectivity. The use of novel oxygen donors as synergistic agents in combination with thenoyltrifluoroacetone provided significant enhancement for the extraction of trivalent lanthanides and actinides. The data showed the best selectivity was obtained using a linear polyether as the synergistic agent. The crown ether and the cryptand showed significant synergistic capabilities but lacked selectivity due to their rigid cavities. The results of this study indicate that the linear polyether is more promising as a synergistic agent because of its flexibility and ease of chemical modification of the end groups. 10 figures, 5 tables. (ERA citation 10:022929)

535,844

DE85009234/GAR PC **A13**/MF **A01**
Ames Lab., IA.
1. Kinetic and Mechanistic Study of the (4+4) Dimerization of 2,3-Dimethylene-2,3-Dihydrofuran. 2. Preparation of 2,3-Dimethylene-2,3-Dihydrobenzo(B)Furan by the Flash Vacuum Pyrolysis of 2-Methyl-3-Benzo(B)Furylmethyl Benzoate. 3. Reaction of 2,3-Dimethylene-2,3-Dihydrofuran with Triplet Oxygen.
C. H. Chou. Mar 85, 288p IS-T-1186
Contract W-7405-ENG-82
Thesis.
Portions of this document are illegible in microfiche products.

A kinetic and mechanistic study of the (4+4) dimerization of 2,3-dimethylene-2,3-dihydrofuran (A) has been carried out based on the secondary deuterium kinetic isotope effects (2 exp 0 D KIE), substituent effects and solvent effects. The 2 exp 0 D KIE was studied by measuring the rate constants, k sub 1 , k sub 2 , k sub 3 and k sub 4 , respectively, for the (4+4) dimerization of A, 2-methylene-3-dideuteriomethylene-2,3-dihydrofuran (B), 2-dideuteriomethylene-3-methylene-2,3-dihydrofuran (C) and 2,3-bis-(dideuteriomethylene)-2,3-dihydrofuran (D). 2-3-Dimethylene-2,3-dihydrobenzo(b)furan (E) was synthesized by the flash vacuum pyrolysis of 2-methyl-3-benzo(b)furylmethyl benzoate. The chemical reactions of E, which were investigated in this study, include thermal dimerization reactions and Diels-Alder reactions. The dimerization reaction of E gave both (4+2) and (4+4) dimers. The formation of cyclic peroxides from the reactions of A and its 5-methyl and 5-tert-butyl derivatives with triplet oxygen was investigated. Thermolysis of a cyclic peroxide gave dialdehyde, hydroxy aldehyde and diol as the products. 150 references, 28 figures, 70 tables. (ERA citation 10:021334)

535,845

DE85700266/GAR PC **A04**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
Annual Report 1983 Chemistry Department (Risoe National Laboratory, Denmark).
J. Funck, E. Larsen, and O. J. Nielsen. May 84, 54p RISO-M-2431
U.S. Sales Only.

This report contains a brief survey of the main activities in the Chemistry Department. All articles and reports published and lectures given in 1983 are presented. The facilities and equipment are barely mentioned. The activities are divided into nine groups: 1. radioisotope chemistry 2. analytical- and organic chemistry 3. environmental chemistry 4. polymer chemistry 5. geochemistry and waste disposal 6. radical chemstry 7. positron annihilation 8. mineral processing 9. general. (Atomindex citation 15:069320)

535,846

DE85700267/GAR PC **A05**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
CHEMSIMUL - A Program Package for Numerical Simulation of Chemical Reaction Systems.
O. Lang Rasmussen, and E. Bjergbakke. Jan 84, 98p RISO-R-395
U.S. Sales Only.

A description is given of a program package, CHEMSIMUL, for numerical simulation of chemical reaction systems. The main components in the package are a translator of chemical equations to differential equations, a balance equation program, a differential equation solver, EPISODE, and an input/output program. The performance of the program is demonstrated by four examples. A manual for the input file and the complete program text with comments are given in Appendices I and II. (Atomindex citation 15:069321)

535,847

DE85700269/GAR PC **A04**/MF **A01**
Junta de Energia Nuclear, Madrid (Spain).
Volatilization-Excitation Phenomena and Efficiency of Spectrochemical Buffers in the Analysis of Geological Samples. I. The Action of the Mixture Li sub 2 CO sub 3 : Graphite.
J. P. Diaz-Guerra, and M. Roca. 1984, 60p JEN-555
In Spanish.
U.S. Sales Only.

The volatilization-excitation mechanisms of Li sub 2 CO sub 3 , SrCO sub 3 and GeO sub 2 as buffers for the determination of different major constituents in geological samples have been investigated considering the phenomena taking place in the electrode, anodic load and arc plasma. The present paper deals with the evaluation of fundamental parameters and processes in d.c. arc that have first been applied to the study of a Li sub 2 CO sub 3 : graphite (1:1) mixture. A second paper is devoted to ascertain the action of each of the other two species. Intensity-time curves, variation of voltage between the electrodes, vapour diffusion through the electrode wall, load depletion, reaction products formation, and temperature, electron pressure and ionization degree in the arc plasma have been studied. The measurement of plasma parameters has been performed by introducing thermometric and manometric species in both the anode and the cathode electrodes. A procedure for calculating the relative emission efficiencies of the analytical lines, taking into account the transportation process, has been developed. (Atomindex citation 15:069323)

535,848

DE85700279/GAR PC **A03**/MF **A01**
National Inst. for Metallurgy, Johannesburg (South Africa).
Preparation of Synthetic Standards for Use in Instrumental Neutron-Activation Analysis.
B. T. Eddy, J. I. W. Watterson, and C. S. Erasmus.
23 Nov 79, 31p NIM-2015
U.S. Sales Only.

An account is given of the formulation and preparation of synthetic standards suitable for the routine analysis of minerals, ores, and ore concentrates by instrumental neutron activation. Fifteen standards were prepared, each containing from one to seven elements. The standards contain forty-four elements that produce isotopes with half-lives longer than 12 hours. An evaluation of the accuracy and precision of the method of preparation is given. (Atomindex citation 15:069346)

535,849

DE85700312/GAR PC **A02**/MF **A01**
Flinders Univ. of South Australia, Bedford Park. Inst. for Atomic Studies.
Valence Electron Momentum Spectroscopy of Inert Gas Atoms.
I. E. McCarthy, J. D. Mitroy, and E. Weigold. 1984, 9p FIAS-R-137
U.S. Sales Only.

The distorted-wave impulse approximation is shown to describe new electron momentum spectroscopy ex-

periments for helium, argon and xenon. Both angular correlations and relative strengths for s- and p-transitions confirm the assignment of spectroscopic factors using the sum rule for states belonging to the inner-valence s-manifolds. (Atomindex citation 16:000225)

535,850
DE85700313/GAR PC **A03/MF A01**
Flinders Univ. of South Australia, Bedford Park. Inst. for Atomic Studies.
Electron Momentum Spectroscopy - Some Recent Developments.
E. Weigold. Mar 84, 31p FIAS-R-124
U.S. Sales Only.

The application of electron momentum (or electron coincidence) spectroscopy to obtaining detailed information on the dynamic structure of atoms and molecules is discussed. The method gives both electron separation energies and one electron momentum densities for each valence orbital in the target. It also measures quantitatively correlation effects in both initial and final many electron states. The sensitivity of the technique as a probe of electron wave functions is discussed with particular reference to some recent work in atoms. Some present and future developments are also briefly outlined. (Atomindex citation 16:000289)

535,851
DE85700315/GAR PC **A02/MF A01**
Flinders Univ. of South Australia, Bedford Park. Inst. for Atomic Studies.
Off-Diagonal Polarisation Potentials in the E-H Coupled Channels Problem.
B. H. Bransden, I. E. McCarthy, and A. T. Stelbovics. May 84, 10p FIAS-R-127
U.S. Sales Only.

Polarisation potentials, explicitly calculated for real channels outside the coupled space, have previously been included only for diagonal matrix elements in the momentum space coupled channels calculation. The effect of the inclusion of the polarisation terms in off-diagonal matrix elements is investigated for electron-hydrogen scattering in the 1s, 2s, 2p channel space at 54.42eV. (Atomindex citation 16:000291)

535,852
DE85700316/GAR PC **A02/MF A01**
Flinders Univ. of South Australia, Bedford Park. Inst. for Atomic Studies.
Noncoplanar Symmetric (e,2e) Reaction on Argon.
I. E. McCarthy, and E. Weigold. 1984, 25p FIAS-R-133
U.S. Sales Only.

Accurate measurements of the 1000eV noncoplanar symmetric (e,2e) reaction on argon are reported. Cross section calculations are carried out using both the plane-wave and distorted-wave impulse approximations. The distorted-wave impulse approximation describes accurately both the 3p and 3s angular correlations and their relative cross sections. The plane-wave impulse approximation overestimates the 3s cross section relative to the 3p and underestimates cross sections at large angles. The 3s spectroscopic factors are assigned up to a separation energy of 55eV and the distorted-wave impulse calculation verifies that all the 3s strength has been found. (Atomindex citation 16:000292)

535,853
DE85700317/GAR PC **A03/MF A01**
Melbourne Univ., Parkville (Australia). School of Physics.
L Subshell X-Ray Production by 100 - 250 KeV/Amu Ions.
M. F. Harrigan, B. M. Spicer, and D. D. Cohen. 1984, 30p UM-P-84/56
U.S. Sales Only.

Individual L subshell ionization cross sections have been measured for bombardment of 100 to 200 keV H exp + ions in 10 keV steps upon a thick Gd target and for bombardment of 600 to 1000 keV He exp + ions in 100 keV steps upon thick W and thick and thin Au targets. Experimental results for the individual L subshells are compared with the theoretical predictions of the ECPSSR theory as developed by Brandt and Lapicki. The differences are discussed as a function of the reduced ion velocity. The occurrence of collision induced intra-shell transitions is discussed as a possible source for the discrepancy between experiment and theory. (Atomindex citation 16:000304)

535,854
DE85700422/GAR PC **A02/MF A01**
Lund Univ. (Sweden). Dept. of Nuclear Physics.
Outdoor Environmental Studies Using Particle Induced X-Ray Emission Analysis. Sampling Multivariate Statistical Evaluation and Instrumental Development.
Doctoral Dissertation (Tekn.Dr.),
H. C. Hansson. Oct 83, 14p LUTFD2/TFKF-1007/1-90(1983)
U.S. Sales Only.

PIXE analysis was used in combination with different samplers to evaluate aerosol long range transport of environmental pollution. Foreign contribution to southern Swedish pollutants was found to be 70 - 80 percent for S and Pb, only 30 - 50 percent for Ni and V. Methods and instruments were developed for sampling of different sizes of aerosols, and also for analysis of wet deposition through rainwater. The program SIMCA was used for pattern recognition. Correlation to meterological data was sought. (Atomindex citation 16:003356)

535,855
DE85700485/GAR PC **A03/MF A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Molecular Orbital Study of Iron Pentacarbonyl and Its Photochemical Fragments Fe(CO) Sub(N).
D. J. R. Guenzburger, E. M. B. Saitovitch, M. A. De Paoli, and H. Manella. 1982, 34p CBPF-NF-035/82
U.S. Sales Only.

Self-consistent Molecular Orbital calculations were performed for Fe(CO) sub 5 and its photofragments Fe(CO) sub(n), $1 <= n < 5$. The discrete variational method was employed, with the X alpha local approximation for the exchange interaction. In the case of Fe(CO) sub 5 , photoelectron and optical spectra are analysed, and photochemical behaviour is discussed. The Moessbauer isomer shifts and quadrupole splittings are investigated. In the case of Fe(CO) sub 5 and Fe(CO) sub 4 , the values derived for these hyperfine interactions are compared to experimental measurements reported in a polyethylene matrix. (Atomindex citation 16:007677)

535,856
DE85700486/GAR PC **A02/MF A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Non-Perturbative Methods Applied to Multiphoton Ionization.
H. S. Brandi, L. Davidovich, and N. Zagury. Sep 82, 17p PUC-TN-13/82
U.S. Sales Only.

The use of non-perturbative methods in the treatment of atomic ionization is discussed. Particular attention is given to schemes of the type proposed by Keldysh where multiphoton ionization and tunnel auto-ionization occur for high intensity fields. These methods are shown to correspond to a certain type of expansion of the T-matrix in the intra-atomic potential; in this manner a criterium concerning the range of application of these non-perturbative schemes is suggested. A brief comparison between the ionization rate of atoms in the presence of linearly and circularly polarized light is presented. (Atomindex citation 16:007682)

535,857
DE85700487/GAR PC **A03/MF A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Electrons and Atoms in Intense Laser Fields.
L. Davidovich. Nov 82, 28p PUC-TN-19/82
In Portuguese.
U.S. Sales Only.

Several non-linear effects that show up when electrons and atoms interact with strong laser fields are considered. Thomson scattering, electron potential scattering in the presence of a laser beam, atomic ionization by strong laser fields, the refraction of electrons by laser beams and the Kapitza-Dirac effect are discussed. (Atomindex citation 16:007683)

535,858
DE85700491/GAR PC **A02/MF A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Interaction of Strong Electromagnetic Fields with Atoms.
H. S. Brandi, L. Davidovich, and N. Zagury. Jun 82, 23p PUC-TN-06/82
U.S. Sales Only.

Several non-linear processes involvoing the interaction of atoms with strong laser fields are discussed, with particular emphasis on the ionization problem. Non-perturbative methods which have been proposed to tackle this problem are analysed, and shown to correspond to an expansion in the intra-atomic potential. The relation between tunneling and multiphoton absorption as ionization mechanisms, and the generalization of Einstein's photoelectric equation to the strong-field case are discussed. (Atomindex citation 16:007754)

535,859
DE85700508/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Lower Temperature Phase of a Nematic Lyomesophase System.
L. Q. do Amaral. Dec 83, 20p IFUSP-P-449
U.S. Sales Only.

The system Na decyl sulphate/water/decanol/Na sulfate, which forms a nematic N sub(L) lyomesophase with planar micelles at 25 deg C, changes to a G phase at 22 deg C on cooling. Phase G studied by x-ray diffraction has a lamellar structure with repetition distance 31.4 A. Comparison of observed and calculated intensities from a step function model defines the G phase as a coagel where lamellae aggregates of extended tilted bilayers with only one layer of solvation water between lamellae, are dispersed in water. This result gives support to the model of aggregates of micelles in the N sub(L) phase, previously proposed. (Atomindex citation 16:007887)

535,860
DE85700509/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Soliton and Polaron Generation in Polyacetylene.
Zhao-bin Su, and Lu Yu. Jul 84, 10p IC-84/97
U.S. Sales Only.

The nonradiative decay of an e-h pair into soliton pair and that of an electron (hole) into polaron as well as the photoproduction of soliton pairs are considered using the lattice relaxation theory of multiphonon processes generalized to include the self-consistency of the multi-electron states with the lattice symmetry breaking. The selection rule which forbids the direct process of photogeneration for neutral pair is derived from the symmetry arguments. The branching ratio of the photogenerated neutral to charged soliton pairs is estimated. The recent related experiments are discussed. (Atomindex citation 16:007921)

535,861
PB85-185197/GAR CP **T05**
Environmental Protection Agency, Research Triangle Park, NC.
Photochemical Box Model (PBM).
Model-Simulation
K. L. Schere. 1 Nov 84, mag tape EPA/600/8-84/022A, EPA/DF-85/006
Source tape is in the ASCII character set. This restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB85-137164.

This magnetic tape contains the FORTRAN source code, sample input data, and sample output data for the Photochemical Box Model (PBM). The PBM is a simple stationary single-cell model with a variable height lid designed to provide volume-integrated hour averages of O3 and other photochemical smog pollutants of interest for an urban area for a single day of simulation. The PBM is most appropriate for application in air stagnation conditions with light and variable winds. Horizontal dimensions of the box are typically on the order of 10-50 km; the vertical dimension may vary between 0.1 and 2 km. Chemical reactions are simulated using a 63-step kinetic mechanism that includes diurnal variation of photolytic rate constants. The depth of the mixed layer, or depth of the PBM domain, also follows a diurnal pattern; it can be optionally specified as following a non-linear growth curve. The PBM assumes that emission sources are homogeneously distributed across the surface face of the box

volume and that the volume is well mixed at all times. Atmospheric diffusion and wind shear are neglected. Software Description: The program is written in the FORTRAN programming language for implementation on a UNIVAC1110 computer using the UNIVAC 1100 operating system Level 38R5A. 45K bytes of core storage are required to operate the model.

535,862
PB85-186690/GAR PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Photoelectrochemical Investigations of Some Ruthenium Dioxide Coated Semiconductor Electrodes,
A. J. McEvoy, and W. Gissler. c1984, 66p EUR-9315-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The photoelectrochemical behavior of several semiconductor electrodes with and without thin ruthenium dioxide coatings have been investigated. Ruthenium dioxide has a metallic character and is known for its property both as oxidizing and reducing catalyst. The ruthenium dioxide coatings have been prepared by r.f. reactive sputtering from a ruthenium dioxide powder target. The chemical composition of the films has been determined by ESCA measurements. The photoelectrochemical investigations comprised the measurement of current vs potential characteristics, space charge capacity vs potential dependences, transient phenomena, corrosion processes and cell performance tests. The photoelectrochemical behavior of only p-type semiconductor electrodes is favorably influenced by the presence of ruthenium dioxide coatings. In general a shift of the onset potential of the photocurrent by some tenths of a volt but no corresponding shift in flat potential is observed indicating that essentially the kinetics of the charge transfer process is influenced. In some cases, however, these beneficial effects of ruthenium dioxide coatings are accompanied by a strong increase of dark current.

535,863
PB85-187318 Not available NTIS
National Bureau of Standards, Boulder, CO.
Shape and Dynamics of States Excited in Electron-Atom Collisions: A Comment on Orientation and Alignment Parameters by Consideration of Attractive and Repulsive Forces.
Final rept.,
N. Andersen, I. V. Hertel, and H. Kleinpoppen. 1984, 9p
Pub. in Jnl. of Physics B: At. Mol. Phys. 17, pL901-L908 1984.

Several ways of parametrizing results of coherence and correlation analysis of atomic excitation in planar scattering experiments have been suggested over the years. Recently, Beyer and Kleinpoppen introduced new scattering amplitudes related to contributions from predominantly the attractive and the repulsive parts of the electron-atom potential. The authors clarify their relation to the so-called neutral amplitudes of Hermann and Hertel and pursue the ideas further for the example of 80 eV electron excitation of the He (2 singlet P)-state. They demonstrate that this way of parametrizing the data is directly related to the experimental observables, enables easy visualization of the shape and dynamics of the charge cloud of the excited electron, and clarifies comparison between theory and experiment.

535,864
PB85-187391 Not available NTIS
National Bureau of Standards (NEL), Boulder, CO. Chemical Engineering Science Div.
Thermal Conductivity of Parahydrogen.
Final rept.,
H. M. Roder. Oct 84, 5p
Pub. in Jnl. of Chemical and Engineering Data 29, n4 p382-386 Oct 84.

The paper presents new experimental measurements of the thermal conductivity of parahydrogen for eight isotherms at temperatures from 100 to 275 K with intervals of 25 K, pressures to 12 MPa, and densities from 0 to 12 mol/L. Three additional isotherms at 150, 250, and 275 K cover para-rich compositions with para percentages varying from 86% to 73%. For these three isotherms the pressures reach 70 MPa and the density a maximum of 30 mol/L. The data for all compositions are represented by a single thermal conductivity surface in which the differences in thermal conductivity for different ortho-para compositions are accounted for in the dilute-gas term. The new measurements are compared with previous data on parahydrogen through the new correlation. It is estimated that the overall uncertainty of both experimental and correlated thermal conductivity is 1.5 percent at the 3 sigma level.

535,865
PB85-187789 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Thermodynamic Surface for Isobutane.
Final rept.,
M. Waxman, and J. Gallagher. 1982, 9p
Sponsored by American Society of Mechanical Engineers, New York.
Pub. in Proceedings of Thermophysical Properties (8th), Gaithersburg, MD, June 15-18, 1981, p88-96 1982.

A thermodynamic surface is presented for the thermodynamic properties of isobutane for the ranges of temperature from 250 to 600 K and of pressures from 0 to 400 bar, exclusive of the critical region. The surface, expressed analytically, is in the form of the Helmholtz free energy as a function of temperature and density. The Helmholtz free energy is based upon the sum of three contributions: that of the ideal gas, of a physically based function incorporating the effects of molecular repulsion and attraction, and of a sum of residual terms that compensate for inadequacies of the physically based function. The latter two contributions are evaluated from only pressure density-temperature data. The significant deviations are in regions where exclusive of vapor pressure data, the liquid and vapor phases are not defined adequately by experimental data. The authors discuss the development of the correlation and also its possible extension to cryogenic temperatures.

535,866
PB85-187847 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Thermodynamic Properties for H2O in the Ideal Gas State.
Final rept.,
H. W. Woolley. 1980, 10p
Sponsored by Verein Deutscher Ingenieure, Duesseldorf (Germany, F.R.).
Pub. in Proceedings of Int. Conference on the Properties of Steam (9th), Munich, Germany, September 10-14, 1979, p166-175 1980.

Ideal gas thermodynamic properties for water have been calculated recently at the National Bureau of Standards. Through the technological range of up to 1500 K, the values obtained are purely or primarily based on values for energy levels of Flaud, Camy-Peyret, and their co-workers. Energies and rotational constants for higher vibrational levels were based on data for low lying vibrational levels of H2O essentially as fitted by Prof. W.S. Benedict of the University of Maryland, including effects of resonance.

535,867
PB85-188159/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Bendiocarb in Industrial and Municipal Wastewaters.
Final rept. Apr-Nov 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 45p EPA/600/4-85/021
Contract EPA-68-03-2956

A method was developed for the determination of bendiocarb in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for the compound from water into methylene chloride; development of a deactivated Florisil cleanup procedure; and determination of suitable liquid chromatographic analysis conditions. Recovery at the 80 microgram/l level was 70 + or - 4 percent. The method detection limit (MDL) for bendiocarb in distilled water was 1.8 microgram/l. The MDL in wastewaters may be higher due to interfering compounds.

535,868
PB85-188209/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Hexachlorophene and Dichlorophen in Industrial and Municipal Wastewaters.
Final rept. Feb-Apr 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 46p EPA/600/4-85/027
Contract EPA-68-03-2956

A method was developed for the determination of hexachlorophene and dichlorophen in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for each compound from water into methylene chloride; and determination of suitable liquid chromatographic analysis conditions. The final method was applied to Columbus Publicly Owned Treatment Works (POTW) secondary effluent in order to determine the precision and accuracy of the method. The method detection (MDL) in reagent water for hexachlorophene was 1.2 micrograms/l and for dichlorophen was 1.0 micrograms/l. The MDL in wastewater may be higher due to interfering compounds.

535,869
PB85-188860/GAR PC **A05**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Stability of Parts-per-Billion Hazardous Organic Cylinder Gases and Performance Audit Results of Source Test and Ambient Air Measurement Systems. Status Report 1,
R. K. M. Jayanty, S. W. Cooper, J. Sokash, and C. E. Decker. Apr 85, 83p EPA/600/4-85/032
Contract EPA-68-02-3767

A repository of 14 gaseous organic compounds at parts-per-billion (ppb) levels in compressed gas cylinders has been established by the U.S. Environmental Protection Agency (EPA). The primary objectives of this on-going project are: (1) to provide accurate gas mixtures to EPA, state/local agencies, or their contractors for performance audits to assess the relative accuracy of source measurement systems during hazardous waste trial burn tests and ambient air monitoring programs; (2) to verify the manufacturer's certified analysis of the multi-component gas mixtures; (3) to determine the stability of the gas mixtures with time; and (4) to develop new audit materials as requested by EPA. The repository consists of two mixtures of five and nine organic compounds in aluminum cylinders in a balance gas of nitrogen. The five component mixture (Group I) contains carbon tetrachloride, chloroform, perchloroethylene, vinyl chloride and benzene. The nine component mixture (Group II) includes trichloroethylene, 1,2-dichloroethane, 1,2-dibromethane, acetonitrile, trichlorofluoromethane, dichlorodifluoromethane, bromomethane, methyl ethyl ketone and 1,1,1-trichloroethane. To date, 20 performance audits have been initiated and 12 are complete. The results of these audits and a description of the experimental procedures used for analyses and available stability data are presented in this Status Report 1.

535,870
PB85-188886/GAR PC **A02**/MF **A01**
Battelle Columbus Labs., OH.
Analytical and Sampling Methodology for Characterization of Polynuclear Aromatic Compounds in Indoor Air,
N. K. Wilson, R. G. Lewis, C. C. Chuang, B. A. Petersen, and G. A. Mack. 1985, 20p EPA/600/D-85/069
Contract EPA-68-02-3487

Sampling and analysis methodology were developed for the collection and quantification of polynuclear aromatic hydrocarbons, their nitro derivatives, and their nitrogen heterocyclic analogs in indoor air. The methodology was evaluated in a study of air in ten homes. The study included homes with and without woodburning fireplaces, gas heat and appliances, and smoking occupants, and with a range of ventilation rates. The range of concentrations in the homes and factors that systematically contribute to those concentrations of selected polynuclear aromatic compounds were estimated. Some practical limitations on the sampling equipment and methodology were identified.

535,871
PB85-188951/GAR PC **A04**/MF **A01**
Battelle Columbus Labs., OH.

C, H, and O Compounds - Cycloprate, Kinoprene, Methoprene, and Resmethrin.
Final rept.,
J. S. Warner, T. M. Engel, P. J. Mondron, and M. C. Landes. Apr 85, 54p EPA/600/4-85/019
Contract EPA-68-03-2956

A method was developed for the determination of four compounds containing only carbon, hydrogen, and oxygen (cycloprate, kinoprene, methoprene, and resmethrin), in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated silica gel cleanup procedure; and determination of suitable gas chromatographic and analysis conditions. Extraction and cleanup procedures were developed to provide 85 percent or greater recoveries of these compounds from the wastewater. The final method was applied to Columbus POTW secondary effluent in order to determine the precision and accuracy of the method.

535,872
PB85-188977/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Bensulide in Industrial and Municipal Wastewaters.
Final rept. Feb-Apr 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 45p EPA/600/4-85/022
Contract EPA-68-03-2956

A method was developed for the determination of bensulide in wastewaters. The method development program consisted of: a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated; Florisil cleanup procedure; and determination of suitable liquid chromatographic analysis conditions. The final method was applied to a relevant industrial wastewater in order to determine the precision and accuracy of the method. The method detection limit (MDL) for bensulide in distilled water was 1.6 micrograms/l. The MDL in wastewaters may be higher due to interfering compounds.

535,873
PB85-188985/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Oryzalin in Industrial and Municipal Wastewaters.
Final rept. Feb-Apr 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 46p EPA/600/4-85/024
Contract EPA-68-03-2956

A method was developed for the determination of oryzalin in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency of oryzalin from water into methylene chloride; development of a deactivated Florisil cleanup procedure; and determination of suitable liquid chromatographic analysis conditions. A method to determine oryzalin in wastewaters was developed. Extraction and cleanup procedures were developed to provide 85 percent or greater recoveries of oryzalin from wastewater. A high performance liquid chromatography (HPLC) method of analysis with ultraviolet detection (UVD) was also developed. The final method was applied to a relevant industrial wastewater in order to determine the precision and accuracy of the method. The method detection limit (MDL) for oryzalin in distilled water was 0.5 micrograms/l. The MDL in wastewaters may be higher due to interfering compounds.

535,874
PB85-188993/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Rotenone in Industrial and Municipal Wastewaters.
Final rept. Feb-Apr 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 45p EPA/600/4-85/023
Contract EPA-68-03-2956

A method was developed for the determination of rotenone in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated silica gel cleanup procedure; and determination of a suitable high performance liquid chromatographic (HPLC) method with ultraviolet (UV) detection. The final method was applied to a relevant industrial wastewater to determine the precision and accuracy of the method. The method detection limit (MDL) for rotenone in distilled water was 1.6 micrograms/l. The MDL in wastewaters may be higher due to interfering compounds.

535,875
PB85-189009/GAR PC **A04**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Thiocarbamates in Industrial and Municipal Wastewater - Butylate, Cycloate, EPTC, Molinate, Pebulate, and Vernolate.
Final rept. Aug 81-Apr 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 60p EPA/600/4-85/017
Contract EPA-68-03-2956

A method was developed for the determination of six thiocarbamate compounds (butylate, cycloate, EPTC, molinate, pebulate, and vernolate) in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated silica gel cleanup procedure; and determination of suitable gas chromatographic analysis conditions. The final method was applied to Columbus Publicly Owned Treatment Works (POTW) secondary effluent in order to determine the precision and accuracy of the method.

535,876
PB85-189017/GAR PC **A04**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Thiophosphates in Industrial and Municipal Wastewaters - Aspon, Dichlofenthion, Famphur, Fenitrothion, Fonophos, Phosmet, and Thionazin.
Rept. for 4 Aug 81-Sep 83,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 66p EPA/600/4-85/016
Contract EPA-68-03-2956

A method was developed for the determination of seven thiophosphate compounds (aspon, dichlofenthion, famphur, fenitrothion, fonophos, phosmet, and thionazin) in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated Florisil cleanup procedure; and determination of suitable gas chromatographic (GC) analysis conditions. Extraction and cleanup procedures were developed to provide 85 percent or greater recoveries of these compounds from water. A packed column GC-AFD analysis procedure was also developed. The final method was applied to wastewater from a manufacturer of malathion and to Columbus Publicly Owned Treatment Works (POTW) secondary effluent in order to determine the precision and accuracy of the method. The wastewaters were spiked with the seven compounds at levels of 50 micrograms/l and 500 micrograms/l, respectively. Recoveries for the seven compounds were in the 85 to 89 percent range at both concentration levels. Method detection limits (MDLs) for the seven compounds in distilled water were in the 1 to 20 micrograms/l range. MDLs in wastewaters may be higher due to interfering compounds.

535,877
PB85-189025/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of MBTS and TCMTB in Industrial and Municipal Wastewaters.
Final rept. Apr-Nov 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 46p EPA/600/4-85/028
Contract EPA-68-03-2956

A method was developed for the determination of MBTS and TCMTB in wastewaters. The method development program consisted of: a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated silica gel cleanup procedure; and determination of suitable high performance liquid chromatographic (HPLC) analysis conditions. Recoveries of MBTS from distilled water ranged from 76 to 94 percent at concentrations ranging from 10 to 1000 micrograms/l. Recoveries of TCMTB from distilled water were greater than 85 percent at concentrations ranging from 10 to 1000 micrograms/l. The method detection limit (MDLs) for MBTS and TCMTB as determined in distilled water were 0.5 and 1.0 micrograms/l, respectively. The MDLs in wastewaters may be higher due to interfering compounds. The final method was applied to Publicly Owned Treatment Works (POTW) secondary effluent to determine the precision and accuracy of the method.

535,878
PB85-189033/GAR PC **A02**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Evaluation of Parts-per-Billion (PPB) Organic Cylinder Gases for Use as Audits during Hazardous Waste Trial Burn Tests.
R. K. M. Jayanty, S. W. Cooper, C. E. Decker, and D. J. von Lehmden. 1985, 20p EPA/600/D-85/076
Contract EPA-68-02-3767

A repository of 14 gaseous organic compounds at parts-per-billion levels (7-430 ppb) in compressed gas cylinders has been established by the Environmental Protection Agency. This repository was established to provide audit materials for use in conducting performance audits to assess the accuracy and precision of Principal Organic Hazardous Constituent (POHC) measurements, especially those performed during hazardous waste trial burn tests. Five- and nine-component mixtures in a balance gas of nitrogen were prepared in aluminum cylinders for use in the performance audit program. The five-component gas cylinders contain carbon tetrachloride, chloroform, perchloroethylene, vinyl chloride, and benzene. The nine-component mixtures contain trichloroethylene, 1,2-dichloroethane, 1,2-dibromoethane, acetonitrile, trichlorofluoromethane, dichlorodifluoromethane, bromoethane, methyl ethyl ketone and 1,1,1-trichloroethane. Studies of all 14 gaseous organic compounds were performed to determine the stability of the compounds and the feasibility of using them in performance audits. Results indicate that all of the 14 compounds were adequately stable to be used as reliable audit materials. Subsequent to completion of the stability studies, several performance audits were conducted using the repository gases to assess the accuracy and precision of the volatile organic sampling-train (VOST) and bag measurement methods. The audit results indicate that laboratories can use these methods to analyze POHC with accuracy to usually within + or - 50% of the audit concentrations.

535,879
PB85-189157/GAR PC **A04**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Neutral Nitrogen-Containing Pesticides in Industrial and Municipal Wastewaters - Fenarimol, MGK 264, MGK 326, and Pronamide.
Final rept. Aug 81-Sep 83,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 60p EPA/600/4-85/018
Contract EPA-68-03-2956

A method was developed for the determination of four neutral nitrogen-containing compounds (fenarimol MGK 264, MGK 326, and pronamide) in wastewaters. The method development program consisted of: a literature review, determination of extraction efficiency for each compound from water into methylene chloride, development of a deactivated Florisil cleanup procedure, and determination of suitable gas chromatographic analysis conditions. The final method was applied to wastewaters from a manufacturer of fenarimol and a manufacturer of pronamide in order to determine the precision of accuracy of the method.

535,880
PB85-189207 Not available NTIS
National Bureau of Standards (NML), Boulder, CO. Quantum Physics Div.
Electron-Impact Excitation of Li II: A Model Study of Wave-Function and Collisional Approximations and of Resonance Effects.
Final rept.,
R. B. Christensen, and D. W. Norcross. Jan 85, 10p
Contract DOE-EA-77-A-01-6010
Pub. in Physical Review A 31, n1 p142-151 Jan 85.

Results are presented of five-state close-coupling and distorted-wave calculations for electron impact excitation of Li II from the ground state to the four n = 2 states for energies below the ionization threshold. Sensitivity of the results to scattering approximation, target wave functions, and resonance effects is examined. The spin-allowed transitions are found to be much more sensitive to scattering approximation and to the choice of target wave functions than are the spin-forbidden transitions, but rather more strongly to the latter.

535,881
PB85-189314 Not available NTIS
National Bureau of Standards (NML), Boulder, CO. Quantum Physics Div.
Resonant Two-Photon Ionization and Dissociation of the Hydrogen Atom and Molecule.
Final rept.,
K. H. Weiga, and H. Rottke. 1984, 10p
Pub. in Proceedings of Int. Conf. on Multiphoton Processes (3rd), Iraklio, Crete, Greece, September 5-12, 1984, p48-57.

The authors report on two experimental studies: (A) the ionization of the H atom in strong external electric fields around the ionization limit by state-selective two-photon, one-photon resonant excitation through single sublevels of the n=2 Stark manifold as intermediate step, and (B) the two-photon, one-photon resonant ionization and dissociation of the H2 molecule through selected rotational-vibrational levels of the B(sup 1) sigma(+1)(sub u) electronic state as intermediate step.

535,882
PB85-190916/GAR PC **E04**/MF **E01**
Council for Mineral Technology, Randburg (South Africa).
Kinetic Study of the Reactions of Certain Gaseous Sulphur Compounds with Iron,
J. A. Theron, and R. J. Dippenaar. 21 Dec 84, 34p
MINTEK-M156, ISBN-0-86999-686-6
Prepared in cooperation with Pretoria Univ. (South Africa).

The object of the investigation was the provision of an improved understanding of the factors that govern the transfer of sulphur in the rotary kiln. The kinetics of the sulphurization and desulphurization of directly reduced iron (DRI) were investigated by a thermogravimetric technique. Whereas the sulphurization of DRI was generally found to be reversible, substantial irreversible sulphurization of a certain porous iron was observed at temperatures higher than 988C (the eutectic temperature of the system Fe-FeS). Results from the literature concerning the sulphurization of iron platelets were confirmed. A difference between the mechanisms involved in the sulphurization of solid iron and that of DRI was detected.

535,883
PB85-191120/GAR PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Determination of Mercaptobenzothiazole in Industrial and Municipal Wastewaters.
Final rept. Apr-Nov 82,
J. S. Warner, T. M. Engel, and P. J. Mondron. Apr 85, 45p EPA/600/4-85/026
Contract EPA-68-03-2956

A method was developed for the determination of mercaptobenzothiazole in wastewaters. The method development program consisted of a literature review; determination of extraction efficiency for each compound from water into methylene chloride; development of a deactivated silica gel cleanup procedure; and determination of suitable liquid chromatographic analysis conditions. Extraction and cleanup procedures were developed to provide 79 percent or greater recoveries of mercaptobenzothiazole from the wastewater. An HPLC analysis method with ultraviolet detection was also developed. The final method was applied to Columbus secondary Publicly Owned Treatment Works (POTW) effluent in order to determine the precision and accuracy of the method. The wastewater was spiked with mercaptobenzothiazole at levels of 5 micrograms/l and 100 micrograms/l. Recovery for mercaptobenzothiazole at the 5 microgram/l level was 79 + or - 5 percent. Recovery at the 100 microgram/l level was 87 + or - 4 percent. The method detection limit (MDL) in distilled water was 1.7 micrograms/l. The MDL in wastewaters may be higher due to interfering compounds.

535,884
PB85-191179/GAR PC **A04**/MF **A01**
Mississippi State Univ., Mississippi State. Dept. of Chemical Engineering.
Reactions of Ozone with Organics in Aqueous Solutions.
Final rept. Nov 81-Nov 84,
C. H. Kuo. Apr 85, 66p EPA/600/3-85/031

Rates of ozonation of some organic pollutants in the aqueous phase were studied. Experiments were conducted in distilled water with pH varying between 2 and 7; the solution temperature ranged from 5C to 35C. Aromatic amines were very reactive with ozone and the reactions were second order. The rate of the naphthylamine/ozone reaction increased with temperature. The aniline/ozone reaction was faster, but was unaffected by temperature changes. The toluene/ozone reaction exhibited a moderate rate. The order of the reaction changed with pH changes. PAHs including naphthalene, anthracene, and phenanthrene reacted with ozone according to second order kinetics. The reaction between ozone and anthracene was the fastest of all systems studied and the reaction rate was nearly independent of acidity.

535,885
PB85-191708/GAR PC **A14**/MF **A01**
North Carolina Univ. at Chapel Hill. School of Public Health.
Outdoor Smog Chamber Experiments Using Automobile Exhaust.
Final rept. Aug 81-Feb 84,
H. E. Jeffries, K. G. Sexton, T. P. Morris, M. Jackson, and R. G. Goodman. Apr 85, 321p EPA/600/3-85/032

Outdoor smog chamber experiments using automobile exhaust were performed in this study. The purpose of the study was to provide a data base that modelers could use to develop new, improved mechanisms for use in the Empirical Kinetics Modeling Approach (EKMA). Thirty-three dual smog chamber experiments were conducted. These included experiments (1) using exhaust from a 1979 Plymouth Volare or a 1972 Dodge Charger, (2) comparing exhaust from two cars using the same gasoline, (3) comparing synthetic auto exhaust with real auto exhaust, and (4) comparing auto exhaust from premium and regular gasoline. Mass spectrometry and high resolution gas chromatography were used to quantify the initial concentration of the auto exhaust organic species.

535,886
PB85-192995 Not available NTIS
Stanford Univ., CA. Dept. of Civil Engineering.
Occurrence and Distribution of Organic Chemicals in Two Landfill Leachate Plumes.
Journal article,
M. Reinhard, N. L. Goodman, and J. F. Barker. c1984, 10p EPA/600/J-84/278
Prepared in cooperation with Waterloo Univ. (Ontario).
Pub. in Environmental Science and Technology, v18 n12 p953-961 1984.

The spatial distribution of trace organic compounds in leachate plumes of two sanitary landfills was established by using multilevel sampling devices. The majority of the compounds originated from decomposing plant material and included aliphatic and aromatic acids, phenols, and terpene compounds. Minor constituents, including chlorinated and non-chlorinated hydrocarbons, nitrogen-containing compounds, alkylphenol polyethoxylates, and alkyl phosphates, were of industrial and of commercial origin. Vertical concentration profiles indicated accumulation of chlorinated solvents beneath the leachate plume. The distribution of trace organics at the two sites was much more complex than that of inorganics commonly used to map leachate plumes. This indicates that extensive monitoring will be required to predict future impacts.

535,887
PB85-193662 Not available NTIS
Radian Corp., Austin, TX.
Comparison of Leachable Trace Element Levels in Coal Gasifier Ash with Levels in Power Plant Ash.
Journal article,
K. J. Bombaugh, M. Milosavljevic, and T. K. Janes. c1984, 7p EPA/600/J-84/274
Contract EPA-68-02-3137
Prepared in cooperation with INKOS, Obilic (Yugoslavia).
Pub. in FUEL, v63 p505-509 Apr 84.

The paper gives results of a comparison of the levels of 14 trace elements in leachates from three types of ash of a common origin coal. The 1-year study was conducted at the Kosovo plant in Obilic, Yugoslavia, comparing coal gasifier ash with fly ash and bottom ash from a coal-fired power plant using lignite from the Dobro Solo mine. Results indicate that levels of Sb, As, Be, Cr, Cu, Pb, Mo, Ni, and Zn in the gasifier ash leachate were similar to those in fly ash leachate. Metal oxides, CaO, MgO, Na2O, K2O, and MnO, in the Kosovo gasifier ash were found at levels similar to those in Kosovo fly ash, and (except for K2O) were about twice those in bottom ash. Concentration levels of all components showed relatively small variations, averaging 50% of their mean annual concentration over the test period.

535,888
PB85-193696 Not available NTIS
Oregon State Univ., Corvallis. Dept. of General Science.
Persistence and Fate of Polynuclear Aromatic Hydrocarbons Deposited on Slash Burn Sites in the Cascade Mountains and Coast Range of Oregon.
Journal article,
T. J. Sullivan, and M. C. Mix. c1984, 8p EPA/600/J-85/034
Pub. in Archives of Environmental Contamination and Toxicology 14, p187-192 Mar 85.

The persistence of polynuclear aromatic hydrocarbons (PNAH) on slash burn sites and movement of these compounds between compartments of the sites has been investigated in the Cascade Mountains and Coast Range of Oregon. Phenanthrene and fluoranthene were gradually lost from the litter, reaching concentrations below detection limits (approximately 2g/ha) less than two years after burning. Higher molecular weight PNAH were more persistent in the litter, decreasing after five years approximately to 19-23% of initial deposition. Differential persistence and fate of PNAH on slash burn sites is explained by physical chemical characteristics of the compounds, such as solubility, vapor pressure, and octanol-water partition coefficient.

535,889
PB85-194009/GAR PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Use of the Thermal Lens Effect for Enhancement of Sensitivity in Molecular Absorption Spectometry, with Special Reference to the Use of a Pulsed Dye Laser as Source,
H. G. C. Human, and N. Omenetto. c1984, 28p EUR-9193-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

A review of the literature on the thermal lens effect is presented. The results of theoretical treatment of the effect is given, and its significance on analytical applications discussed. Considerable enhancement of the sensitivity over conventional spectrophotometry is possible. Special attention was given to heating by a pulsed laser, showing that this method has considerable potential.

535,890
PB85-194447/GAR PC **E06**/MF **E06**
Commission of the European Communities, Luxembourg.
Certification of the Contents (Mass Fractions) of Cadmium, Copper, Iron, Mercury and Lead in One Natural Sample of Skim Milk Powder (BCR No. 63) and in Two Spiked Samples of Skim Milk Powder (BCR No. 150 and 151),
B. Griepink, E. Colinet, H. Gonska, and H. Muntau. c1983, 101p EUR-9251-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The report describes the preparation of three reference materials: a skim milk powder with natural levels of trace elements (CRM 63); and two powders of skim milk (CRM 150 and 151) enriched in heavy metals (Cd, Cu, Fe, Hg and Pb). The highest level is close to the limit for each element beyond which the milk would not be allowed on the market. The natural milk powder (CRM 63) is also certified for the major elements (report EUR 9138). The analyses were carried out by several methods selected for producing the most accurate results and were performed by several laboratories experienced in dairy analysis and in trace element analysis.

535,891
PB85-195600/GAR PC **E04**/MF **E01**
Harvard Univ., Cambridge, MA. Center for Earth and Planetary Physics.

Theoretical Studies of Long-Range Transport of Oxidants.
Annual technical rept.,
M. B. McElroy, S. C. Wofsy, J. A. Logan, and M. J. Prather. 11 Feb 85, 32p CRC-APRAC-CAPA-22-83-01

The goal of this project is to develop a model for the North American continent which will incorporate in a realistic dynamical framework the mechanisms responsible for the production and loss of rural ozone, enabling evaluation of the relative importance of various processes and the effective contribution of different sources of hydrocarbons and NOx. The model will also be used to investigate the fate of anthropogenic NOx and its role in acid deposition. This report describes the first year of development of the coupled model for chemistry and transport of trace gases on a continental scale. Testing and validating the climatology of the model have begun. The urban scale photochemical box model, which will be used to estimate the flux of pollutants which leave an urban area and are released into the large scale circulation, has been developed. Significant progress has been made towards synthesizing and analyzing data for rural ozone, which will provide the basis for an ozone climatology to be used for model verification.

535,892
PB85-201515 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Comments on 'Scaling Theory and Enthalpy of Mixing for Binary Mixtures' (and Reply).
Final rept.,
G. Morrison, G. T. Brinke, and F. E. Karasz. 1983, 3p
Pub. in Jnl. of Chemical Physics 78, n7 p4790-4792, 1 Apr 83.

A brief geometric argument showing the connection between the excess properties of mixing for binary mixtures near a critical point and the second law of thermodynamics.

535,893
PB85-201788 Not available NTIS
National Bureau of Standards, Gaithersburg, MD. Polymers Div.
Hydrolysis of Dicalcium Phosphate Dihydrate in the Presence or Absence of Calcium Fluoride.
Final rept.,
M. S. Tung, L. C. Chow, and W. E. Brown. Jan 85, 4p
Sponsored by American Dental Association Health Foundation, Chicago, IL.
Pub. in Jnl. of Dental Research 64, n1 p2-5 Jan 85.

Effects of temperature (25 and 37C), pH (4.9-10.5) and CaF2 on CaHPO4:2H2O (DCPD) hydrolysis were studied in a pH-stat. Octa-calcium phosphate (OCP) was the product at pH 6.2-6.8 and 25-37C; thermodynamically stable apatitic compounds were formed at higher pH and/or higher temperature. In the presence of CaF2, apatite was the product, its crystallinity improved, and the fluoride content increased as pH of the reaction decreased. The results demonstrate the remarkable ability of fluoride to promote the hydrolysis of an acidic calcium phosphate, DCPD, to apatite.

535,894
PB85-202869 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Uniformly Valid Asymptotic Solutions of Chemical Rate Equations for Irradiation-Produced Point Defects.
Final rept.,
R. E. Mickens. 1983, 9p
Pub. in Acta Physica Polonica A 64, n1 p59-67 Jul 83.

The authors present a perturbation technique for obtaining solutions to a pair of nonlinear coupled differential equations which model the behavior of the kinetics of irradiation-produced interstitials and vacancies. The procedure eliminates secular terms at each stage of the calculation; consequently, the solutions are uniformly valid for 0 < or = t < infinity.

535,895
PB85-202877 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Comparative Rate Single Pulse Shock Tube Studies on the Thermal Stability of Polyatomic Molecules.
Final rept.,
W. Tsang. 1981, 71p
Pub. in Shock Tubes and Chemistry, p59-129 1981.

The comparative rate single pulse shock tube technique is shown to offer unique advantages for the determination of unimolecular rate parameters for the transformations of polyatomic organic molecules. The results derived from this method on bond fissions, complex fissions and isomerizations are summarized. Particularly noteworthy are the regularities and interrelationships in the rate parameters. Results on the bond fission reactions have led to rates that are much lower than originally expected. This is brought about by smaller A-factor (for the alkanes) and higher carbon-carbon bond energies. The former is suggestive of a transition state that grows 'tighter' with temperature, while the latter calls into question heats of formation of organic radicals determined by metathesis reactions. It is demonstrated that the new bond energies provide a much sounder basis for the biradical mechanism for cis-trans isomerization and small ring decyclization. Directions for future work are indicated.

535,896
PB85-204345/GAR PC **A13**/MF **A01**
Oklahoma Univ., Norman. School of Chemical Engineering and Materials Science.
Equation of State Study for Polar Fluids. Final Report November 1980-October 1984,
K. E. Starling, L. L. Lee, T. H. Chung, M. H. Li, and C. K. So. Nov 84, 294p GRI-85/0002
Contract GRI-5080-363-0376
See also PB84-222801.

The authors have succeeded in developing a highly accurate equation of state for polar fluids and mixtures that is applicable to natural gas systems and a wide range of fluids. They generally have made advances in the molecular theory of mixtures, i.e., in the formulation of a statistical mechanical local composition theory. In applications they have demonstrated the applicability of their equation to 51 pure fluids and 83 mixture systems that are highly nonideal.

535,897
PB85-860831/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Water Chemistry: Analysis for Heavy Metals. 1977-May 1983 (Citations from the Selected Water Resources Abstracts Data Base).
Rept. for 1977-May 83.
Jun 85, 463p
Prepared in cooperation with Office of Water Research and Technology, Washington, DC.

This bibliography contains citations concerning water quality parameters of on-stream and off-stream sites with specfic reference to heavy metal contamination. Methods for individual and simultaneous multielement determinations are discussed. Interference effects and methods to minimize these effects are explained. The ecological consequences of heavy metal contamination are also presented. (This updated bibliography contains 330 citations, none of which are new entries to the previous edition.)

535,898
PB85-860849/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Water Chemistry: Analysis for Heavy Metals. June 1983-May 1985 (Citations from the Selected Water Resources Abstracts Data Base).
Rept. for Jun 83-May 85.
Jun 85, 85p
Supersedes PB83-864793. Prepared in cooperation with Office of Water Research and Technology, Washington, DC.

This bibliography contains citations concerning water quality parameters of on-stream and off-stream sites with specfic reference to heavy metal contamination. Methods for individual and simultaneous multielement determinations are discussed. Interference effects and methods to minimize these effects are explained. The ecological consequences of heavy metal contamination are also presented. (This updated bibliography contains 73 citations, all of which are new entries to the previous edition.)

535,899
PB85-861862/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gel Permeation Chromatography. July 1983-June 1985 (Citations from the Engineering Index Data Base).
Rept. for Jul 83-Jun 85.
Jun 85, 129p
Supersedes PB84-868546.

This bibliography contains citations concerning the application of gel permeation chromatography (GPC), or size exclusion chromatography, to the seperation, identification, characterization, analysis, and determination of molecular weights, properties, and compositions of various substances, especially polymers. Methods of calibrating GPC instruments are also presented. (This updated bibliography contains 149 citations, 82 of which are new entries to the previous edition.)

7E. Radio and Radiation Chemistry

535,900
AD-A153 508/7 Not available NTIS
Columbia Univ., New York. Dept. of Chemistry.
Fluorescence Quenching of Methoxybenzyl Alcohols by the Hydronium Ion in Aqueous Solution: Acid-Catalyzed Formation of Methoxybenzyl Cations from the Singlet Excited State,
N. J. Turro, and P. Wan. 1985, 11p ARO-19800.5-CH
Contract DAAG29-83-K-0047
Availability: Pub. in Jnl. of Photochemistry, v28 p93-102 1985 (No copies furnished by DTIC/NTIS).

The photochemical and photophysical behavior of a number of methoxy-substituted benzyl alcohols has been studied in aqueous solution as a function of pH. Evidence is presented which indicates that, on excitation to the singlet excited state, the ortho and meta methoxy-substituted benzyl alcohols undergo proton-assisted loss of hydroxide ion to give the corresponding benzyl cations. These results are discussed with reference to the photoselectivity observed by Zimmerman and Sandel in the photosolvolysis of methoxybenzyl acetates.

535,901
DE85007885/GAR PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Technique for Measuring Surface Diffusion by Laser-Beam-Localized Surface Photochemistry.
H. J. Zeiger, J. Y. Tsao, and D. J. Ehrlich. 1985, 26p
SAND-84-2114C, CONF-850273-1
Contract AC04-76DP00789
Topical meeting on microphysics of surfaces, beams and adsorbates, Santa Fe, NM, USA, 4 Feb 1985.

A technique has been developed for determining the surface diffusivity of a weakly bound adsorbate by measuring the kinetics of a spatially localized, laser-beam-driven surface photoreaction. The diffusivity is extracted from the experimental data by means of a general theoretical analysis in which the diffusion equation is solved by a Green's function integral technique. The solution is numerically integrated in order to calculate the spatial and temporal evolution of the surface-number-density of parent and product molecules in a beam-localized adsorbate reaction. The new technique has been used to determine the surface diffusivity of tetraethyl lead molecules adsorbed on sapphire from data on the deposition of thin films by photolysis of these molecules. The technique may be more broadly applicable to the measurement of the surface diffusion of other weakly bound or fragile polyatomic molecules. (ERA citation 10:023210)

535,902
DE85008515/GAR PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Adiabatic Approach in the Theory of Polyatomic Photodissociation: Application to C sub 2 N sub 2.
W. A. Lester, V. Z. Kresin, and C. E. Dateo. Nov 84, 11p LBL-18651, CONF-8411153-3
Contract AC03-76SF00098
International conference on lasers '84, San Francisco, CA, USA, 26 Nov 1984.

An adiabatic method for nuclear motion has been developed and applied to single-photon predissociation of C sub 2 N sub 2 . The theoretical predictions are in good accord with recent measured product energy dis-

tributions. 15 references, 1 figure. (ERA citation 10:022950)

535,903
DE85700284/GAR PC **A02/MF A01**
Risoe National Lab., Roskilde (Denmark).
Input Files for Computer Simulation of Water Radiolysis.
E. Bjergbakke, K. Sehested, O. Lang Rasmussen, and H. Christensen. Apr 84, 23p RISO-M-2430
U.S. Sales Only.

This report contains radiation chemistry input files for CHEMSIMUL, a program package for numerical simulation of chemical reaction systems. (Atomindex citation 15:069457)

535,904
PB85-192862/GAR PC **E04/MF E04**
Commission of the European Communities, Luxembourg.
Mechanism of Photosynthetic Oxygen Evolution: A Study of the Primary Photoreactions and of Electron Carriers,
P. Mathis, G. Paillotin, H. Conjeaud, A. W. Rutherford, and C. C. Schenck. c1984, 62p EUR-9274-EN
See also PB82-146606.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The process of oxygen evolution in green plants is realized by the so-called 'Photosystem-II', a complex ensemble of pigments, of electron carriers and lipo-proteins, whose composition and structure are poorly known. The research aimed at increasing the authors knowledge on this complex (its chemical composition, its structure, its reaction mechanisms), by the way of spectroscopic and physico-chemical studies on the 'intact' chloroplast on chloroplast particles. A detailed analysis of this electron transfer has been made.

535,905
PB85-194017/GAR PC **E03/MF E03**
Commission of the European Communities, Luxembourg.
Photochemical Dissociation of Water in Colloidal Clay Suspensions,
H. Nijs, F. Bergaya, D. Challal, J. J. Fripiat, and H. van Damme. c1984, 41p EUR-9134-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

In order to construct a photolytic cell for water based on mixed inorganic colloids, as proposed for this project, the different variables playing a role in such a system were closely investigated. New catalysts and electron acceptors were developed to achieve true catalytic light-induced water splitting. It was shown by so called 'sacrificial' reactors that, when clay minerals are used in such systems, steric factor might prevent the reaction to proceed. A judicious choice of the clay mineral to be used is necessary. Efficient clays are in fact those that have a negligible internal surface. The same type of 'sacrificial' reactions permitted the development of electron acceptors embedded in positively charged Al(OH)x colloids. These acceptors are the hydroxides of Eu, Sm and In. Their physicochemical behavior in the reduction of water is described in detail. It is further shown that the combination of the negatively charged clay colloid, charged with a photosensitizer, and the positively charged acceptor colloid leads to the cyclic photolysis of water by visible light. This photodissociation is often periodic and the system is rapidly poisoned. The origin of the latter phenomenon is still to be clarified.

535,906
PB85-195188/GAR PC **E04/MF E04**
Commission of the European Communities, Luxembourg.
Photosynthetic Water Oxidation by Green Plants: On the Role of Protons,
W. Junge, and V. Foerster. c1984, 65p EUR-9331-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

This report is devoted to the protolytic reactions which accompany electron abstraction from water and are expected to give a clue to the intermediate stages of stepwise catalysis. Broken chloroplasts from higher plants were studied. A spectro-photometric technique to measure proton release into the narrow (20nm) inner phase of thylakoids was perfected for very high sensitivity (.001 pH-units) at high time resolution (1 microsecond) and with regard to spatial resolution. Starting from the lowest oxidation state of the manganese protein a stoichiometric pattern of proton release per electron abstracted was observed. The authors furthermore determined the stoichiometry and the kinetics of proton release in the presence of hydroxylamine. Based on this information the authors define restrictions for possible mechanisms of water oxidation. However, the exact mechanism still remains obscure, mainly because of insufficient knowledge on the state of manganese in the enzyme. Further work will be directed to probe the enzyme with several different water analogues.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

535,907
AD-A153 478/3/GAR PC **A06/MF A01**
South Carolina Wildlife and Marine Resources Dept., Charleston. Marine Resources Div.
Benthic and Sedimentological Studies of the Georgetown Ocean Dredged Material Disposal Site.
Technical rept.,
R. F. Van Dolah, D. M. Knott, E. L. Wenner, T. D. Mathews, and M. P. Katuna. Feb 84, 103p Rept no. TR-59
Contract DACW60-83-C-0005

Specific objectives of this study were to: (1) Provide a review of existing information on the physical, chemical and biological conditions in the vicinity of the Georgetown DMDS and provide a succinct description of biological, recreational, or other resources that might be affected by ocean disposal; (2) Describe the mineralogical, textural, and chemical characteristics of the bottom sediments in the Georgetown DMDS, in a control site, in three stations 'down current' of the DMDS, and in the navigation channel; (3) Describe the sediment bedforms present in the Georgetown DMDS, in the control area and in the three 'down current' stations with regard to their size, orientation, and composition; (4) Ascertain whether the sediment characteristics of the DMDS and the stations 'down current' have been altered by current disposal practices; (5) Describe temperature-depth, salinity-depth, and dissolved oxygen-depth profiles in the water column at all stations, and determine concentrations of metals, pesticides, PCB's, high molecular weight hydrocarbons, and the turbidities at four stations (one DMDS station, one control station, one 'down current' station, and one entrance channel station); (6) Characterize the species composition and density of benthic communities in the DMDS, in the control site, and in the 'down current' stations; (7) Determine the degree of bioaccumulation of pollutants in selected sedentary benthic organisms collected from the DMDS, control site, and 'down current' stations; and (8) Assess the effects of the present dredged material disposal practices on bottom communities in the DMDS and the three 'down current stations.

535,908
AD-A153 823/0/GAR PC **A04/MF A01**
Naval Ocean Research and Development Activity, NSTL Station, MS.
Chemical, Biological, and Physical Measurements from the Subtropical Western North Atlantic Ocean. Summer 1982, USNS LYNCH, Cruise 710-82.
Technical note,
D. A. Wiesenburg, D. F. Reid, D. M. Lavoie, and I. P. DePalma. Jan 85, 63p Rept no. NORDA-TN-306

Several years ago the Naval Ocean Research and Development Activity initiated a project to examine the interrelationships between dissolved trace gases and suspended particulate material in the upper water column of the world oceans. The goal of the project was to observe and understand the variations in biological parameters, gas distributions and suspended particulate layers to provide an assessment of in situ gas production mechanisms associated with particulate material. This report is a summary of data collected in the western North Atlantic Ocean in the summer of 1982 aboard USNS LYNCH, Cruise 710-82. Vertical profiles through most of the water column were obtained for the following parameters: conductivity, temperature, salinity, nephelometry, transmissometry, total suspended matter, dissolved and particulate organic carbon, adenosine triphosphate (ATP), chlorophyll and phaeopigments, nutrients (nitrate), nitrite, ammonium, phosphate, silicate), dissolved oxygen and dissolved reduced gases (methane and nitrous oxide). Tables of the measured and certain derived parameters are given, along with descriptions of the collection and analytical procedures.

535,909
PB85-179984/GAR PC **E06/MF E06**
Water Research Centre, Stevenage (England).
Investigations of Sewage Discharges to Some British Coastal Waters. Chapter 8. Bacterial Mortality, Part 1.
Technical rept.,
A. L. H. Gameson. c1984, 41p TR-201

Inadequate knowledge of the rate of bacterial mortality in the marine environment is the greatest source of uncertainty in predictive calculations of the bacterial levels associated with a sewage discharge. In situ studies are costly and complicated to conduct, and the relevance of many factors is more readily examined under laboratory conditions, but even there the variability in the results obtained makes it difficult to draw firm conclusions without large numbers of experiments. Solar radiation has been found to enhance bacterial mortality in the sea and is a factor of major importance. Part 1 of Chapter 8, however, is restricted to the examination of bacterial mortality in the dark and deals with the shore-based experiments for which the Center has been responsible since 1966. (Copyright (c) Water Research Centre, 1984.)

535,910
PB85-185379/GAR PC **A05/MF A01**
Martin Marietta Environmental Systems, Columbia, MD.
Effects of Screen Slot Size, Screen Diameter, and Through-Slot Velocity on Entrainment of Estuarine Ichthyoplankton Through Wedge-Wire Screens.
Final rept.,
S. B. Weisberg, W. H. Burton, E. A. Ross, and F. Jacobs. Aug 84, 92p PPSP/CP-84-1

Tests were conducted in the Patuxent estuary from August 1982 to July 1983 to determine how certain design characteristics of wedge-wire screens affect entrainment of ichthyoplankton through the screens. The study examined the effect of (a) altering screen slot size (1mm, 2mm, and 3mm screens) while maintaining a constant through-slot velocity. Size specific responses of two species, bay anchovy (Anchoa mitchilli) and naked goby (Gobiosoma bosci), were examined. The effect of screen diameter was found not to be very important, particularly for larger fish. For small individuals, a reduction of the screen diameter was accompanied by a slight reduction in entrainment.

535,911
PB85-185866/GAR PC **A04/MF A01**
Martin Marietta Environmental Systems, Columbia, MD.
Prevalence and Effects of 'Eustrongylides' (Nematoda) Infection in 'Fundulus Heteroclitus and other Fished of the Chesapeake Bay Region,
S. B. Weisberg, R. P. Morin, E. A. Ross, and M. R. Hirshfield. Nov 84, 51p PPRP-97
Prepared in cooperation with Academy of Natural Sciences of Philadelphia, Benedict, MD. Benedict Estuarine Research Lab.

A survey of Fundulus heteroclitus and other fish species for Eustrongylides (Nematoda) infection was conducted at twenty-one Chesapeake Bay tributary stations in 1983. For F. heteroclitus, parasite prevalence ranged from 0 to 41.3% among sites, and was negatively correlated with salinity. The highest prevalence was found at stations located near sewage-treatment plants and a heron rookery. Difference in prevalence among sites could be explained by density of the nematode's intermediate host, Limnodrilus sp., which was positively correlated with parasite prevalence. Prevalence was also found to be positively correlated with fish length.

535,912
PB85-186039/GAR PC **A07**/MF **A01**
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
Catalogue of Cephalopods at the National Marine Mammal Laboratory.
Technical memo.,
C. H. Fiscus. Oct 84, 126p NOAA-TM-NMFS-F/NWC-65

The collection of fishes and cephalopods at the National Marine Mammal Laboratory (NMML) of the Northwest and Alaska Fisheries Center (NWAFC) was started in the late 1940s by Victor B. Scheffer, Ford Wilke, and Karl W. Kenyon. The cephalopod collection is used primarily as an aid to the identification of cephalopod remains found in the stomachs, scats, and spewings of marine mammals. Specimens are classified to the lowest possible taxon. The collection presently contains cephalopods representing 22 families, 36 genera, and 41 species. Most of the material is from the eastern North Pacific Ocean and the Bering Sea; however, seven species from the western North Pacific Ocean, six from the eastern tropical Pacific Ocean, and three from the Atlantic Ocean are also represented in the collection.

535,913
PB85-186047/GAR PC **A07**/MF **A01**
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
Fur Seal Investigations, 1982.
Technical memo.,
P. Kozloff. Jan 85, 136p NOAA-TM-NMFS-F/NWC-71

Research on the northern fur seal, Callorhinus ursinus, in 1982 was conducted on the Pribilof Islands, Alaska; on San Miguel Island, California, and nearby Castle Rock; and in the Bering Sea. An estimate was made of the number of pups born in 1982 on St. Paul Island, Alaska, including the sizes of the 1940, 1977 and 1978 year classes. Studies in 1982 showed that the majority of net fragments in which fur seals become entangled have a stretched mesh size of about 20-25 cm. A study of juvenile survival (birth-age 2 yr) on the Pribilof Islands concluded that survival on land is somewhat higher on St. George than on St. Paul. Pup production at both Adams Cove (1,029) on San Miguel Island and nearby Castle Rock (680) was greater in 1982 than in any previous year. Dietary studies based on the principal prey species of fur seals and the relative abundance of fish-squid resources suggest that fur seals are opportunistic feeders. Chlorinated hydrocarbons were found in the tissues of northern fur seals from St. Paul Island.

535,914
PB85-188084/GAR PC **A03**/MF **A01**
Florida Sea Grant Coll., Gainesville.
Manual on Shark Fishing,
W. S. Otwell, F. J. Lawlor, J. A. Fisher, G. H. Burgess, and F. J. Prochaska. Feb 85, 50p SGR-73
Grant NA80AA-D-00038

This manual was undertaken out of a recognition that potential alternative shark fisheries in Florida need additional understanding. During the past few years, Florida Sea Grant Extension personnel have fielded frequent requests for information about shark which indicates a continuing interest to initiate a fishery. Sharks are always appearing on underutilized species lists destined for fishery development efforts, and several government agencies have been involved in various development projects that are adding to the authors understanding of the 'shark fishery'. The primary reason for the World War II era rise of the fishery was that shark livers are high in oil, a good source of Vitamin A. The demise of the fishery in the U.S was also linked to Vitamin A. By 1950 an inexpensive synthetic Vitamin A became available and the U.S. commercial shark fishery declined to a very low level. Today, sufficient interest has developed in all aspects of the shark fishery to the point where a federal preliminary Fishery Management Plan has been written.

535,915
PB85-861888/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ecology of Marine Molluscs. 1980-June 1985 (Citations from the Life Sciences Collection Data Base).
Rept. for 1980-Jun 85.
Jun 85, 87p
Supersedes PB84-870062. Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning ecological aspects of marine molluscs. Topics include feeding behavior, population studies, bioaccumulation and effects of pollutants, and temperature and salinity tolerances. Reproduction and growth aspects are also considered. (This updated bibliography contains 94 citations, 21 of which are new entries to the previous edition.)

8C. Dynamic Oceanography

535,916
AD-A153 675/4/GAR PC **A02**/MF **A01**
Woods Hole Oceanographic Institution, MA.
Evidence for Baroclinic Instability in the Gulf Stream Recirculation,
N. G. Hogg. Jan 85, 23p Rept no. WHOI-CONTRIB-5384
Contract N00014-76-C-0197
Pub. in Prog. Oceanog., v14 p209-229 1985.

The empirical orthogonal function technique has facilitated the dynamical investigation of a coherent array of current meters from Polymode Array 2 in the Gulf Stream recirculation. Investigations of the horizontal and vertical structure of the low frequency eddy field has revealed a striking resemblance to the theoretical calculations of GILL, GREEN and SIMMONS (1974). In particular: (i) The zonal phase speed of disturbances is nearly frequency independent, westward and of magnitude 12 cms such that the steering level for disturbances is in the upper thermocline above 600 m. (ii) A strong peak in variance conserving kinetic energy spectra exists at 30 day periods along with a much weaker one at 12 days. These peaks correspond, almost exactly, to the predicted secondary and primary growth rate peaks of GILL, GREEN and SIMMONS(1974). (iii) Phase propagation (at 30 day periods and longer) is upward toward the west for velocity and downward toward the west for temperature. The different vertical phase trends lead to the potential energy release being concentrated in the thermocline. (iv) Zonal growth rates, although not statistically significant, are similar to those predicted. Motions at this point in the recirculation have not yet reached a finite amplitude equilibration. (v) The vertical structure is qualitatively similar to predictions. The 30 day mode is only weakly depth dependent and has upward phase propagation in velocity (downward in temperature).

535,917
AD-A153 748/9/GAR PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Utilization of the SEASAT Scatterometer Winds for Ocean Mixed Layer Modeling.
Master's thesis,
E. J. Coolbaugh. Dec 84, 101p

A study is made of the feasibility of using SEASAT Scatterometer wind measurements as the surface wind stress forcing for an ocean mixed layer model. Comparisons are made of daily SASS and FNOC winds and the respective mixed layer model results on a 2 degree latitude by 5 degree longitude grid from July 15 to August 15, 1978 in the Anomaly Dynamics Study region of the North Pacific Ocean. The direct comparison of the SASS and FNOC wind fields showed good agreement. Cases of reduced pattern correlation between the SASS and FNOC winds appear to result from periods of low percentage coverage by the SASS wind fields and the difference in spatial resolution between the SASS and FNOC winds. The results of the model comparison of the wind fields show the model's high sensitivity to the accuracy of its wind speed boundary condition. Nevertheless, the SASS and FNOC winds gave similar model results, demonstrating the potential of scatterometer wind speed measurements for use with future ocean mixed layer model prediction.

535,918
AD-A153 782/8/GAR PC **A04**/MF **A01**
Coastal Engineering Research Center, Vicksburg, MS.
Summary of Archived Atlantic Coast Wave Information Study Pressure, Wind, Wave, and Water Level Data.
Final rept.,
R. M. Brooks, and W. D. Corson. Aug 84, 57p Rept no. WIS-13
Report on Wave Information Studies of US Coastlines.

This report is a summary of seven data sets produced and archived by the Wave Information Study (WIS) for the Atlantic coast: (1) surface pressure fields, (2) Phase I hindcast wind fields, (3) Phase I deepwater wave data, (4) Phase II hindcast wind fields, (5) Phase II hindcast wave data, (6) Phase III nearshore wave data, and (7) water level data. The wave parameters from the data sets listed in 2, 5, and 6 have been incorporated into WIS's computer-based data system, the Sea-State Engineering Analysis System (SEAS), which is available to all Corps of Engineers personnel. These data sets, except for 1 and 7, have been transferred to the National Climatic Data Center (NCDC) in Asheville, North Carolina. These data may be obtained through Customer Service at NCDC (reference Tape Deck 9787). Originator-supplied keywords: Ocean waves--Atlantic coast--Statistics; Pressure; Winds; Water levels.

535,919
AD-A153 839/6/GAR PC **A02**/MF **A01**
Florida State Univ., Tallahassee. Dept. of Oceanography.
Abyssal Eddies Near the Gulf Stream,
E. A. Kelley, and G. L. Weatherly. 20 Mar 85, 10p Rept no. 236
Contract N00014-82-C-0404
Pub. in Jnl. of Geophysical Research, v90 nC2 p3151-3159, 20 Mar 85.

A comparison is made of long (8-12 months) records of three near-bottom current meters with satellite-derived frontal positions of Gulf Stream meanders and rings. Energetic fluctuations with time scales 0 (30-90 days) coincide with, and most probably result from, the movement of Gulf Stream meanders and rings. Originator-supplied keywords: Eddies, Gulf Stream, Abyssal flows, Deep circulation.

535,920
AD-A153 860/2/GAR PC **A06**/MF **A01**
Scripps Institution of Oceanography, La Jolla, CA. Marine Physical Lab.
Environmental Background Measurement Program.
Final rept.,
K. M. Watson, and V. C. Anderson. 15 Feb 85, 124p Rept no. MPL-U-7/85
Contract N00014-79-C-0983

From 1 October 1980 through 30 September 1984 a program of data analysis and interpretation was conducted at the Marine Physical Laboratory under the sponsorship of NORDA Code 500. The focus of this effort, termed the Environmental Background Measurement Program, was on the statistics of the finite scale shear and density fields in the sea. Special effort was placed on determining the degree of predictability of these fields, the degree to which linear internal wave theory could account for them, and the degree to which existing models of the wavefield were accurate. With additional support from ONR Codes 220 and 420, significant progress was achieved on these tasks. Another task completed under this contract was the hardware and software design of a digital control system for a seafloor work vehicle (RUM III). The digital control system for the vehicle will be used to enhance its usefulness as an operational sea floor work vehicle. The functional requirements, design constraints, and system configuration were first examined. A detailed description of the hardware systems and their corresponding software components are described in this report. MPL also participated in the acquisition, adaptation and installation of a side-looking sonar system for use on the Advanced Unmanned Search System (AUSS) Testbed Program being developed at the Naval Ocean Systems Center, San Diego. In support of an ocean optics measurement project conducted by

NOSC personnel aboard the research platform FLIP, MPL modified and installed two aluminum truss booms (60 ft and 75 feet) from which the oceanographic instrumentation was suspended, resulting in successful data acquisition.

535,921
PB85-179628/GAR PC E03/MF E03
Offshore Technology Testing and Research Group, Trondheim (Norway).
Dynamic Estimation Theory as a Basis for Prediction of Polar Lows,
K. J. Eidsvik. 1984, 18p TR-1
Also pub as Norges Tekniske Hoegskole, Trondheim. Selskapet for Industriell og Teknisk Forskning rept. no. STF68-A84004.

Oil related activities require an accurate prediction system for 'polar lows' over lead times of the order 4 to 6 hrs. It is discussed how dynamic estimation theory could be used as a basis for designing such a system. It is further suggested that a simple model for polar low trajectories should be estimated and used for prediction.

8D. Geochemistry

535,922
DE85700310/GAR PC A02/MF A01
International Atomic Energy Agency, Vienna (Austria).
Measurements of Thermodynamic Constants of Transuranic Compounds to Predict Their Geochemistry: Carbonate Complexation of Np(V) And Am(III), Hydrolysis of Pu(VI) And AM(III).
P. Vitorge. Feb 84, 13p IAEA-SR-104/25, CONF-840217-1
In French.Seminar on site investigation and assessment methods and techniques for underground disposal of radioactive wastes, Sofia, Bulgaria, 6 Feb 1984.
U.S. Sales Only.

This work is a part of a project to build a waste disposal and to model the behaviour of the radioactive elements. The contribution consists in the prediction of the geochemistry of actinides and the measurement of thermodynamic equilibrium constants, solubility products and redox potentials (E) used in the migration model. It has shown that literature can provide values for some of these constants and proposed theoretical E(pH) diagrams and solubilities of U, Np, Pu, Am. All transport will occur essentially in the aqueous phase leaching the repository site, where hydrolysis and carbonate complexation are important chemical reactions. The hydrolysis and carbonate complexation constants have already been reviewed. The experimental results are compared with the literature data which are usually chosen to predict the solubilities and the proportions of the different forms of these actinides in natural ground waters. (Atomindex citation 15:071856)

8E. Geodesy

535,923
AD-A153 612/7/GAR PC A08/MF A01
Naval Postgraduate School, Monterey, CA.
Comparison of Methods of Least Squares Adjustment of Traverses.
Master's thesis,
S. Aumchantr. Dec 84, 152p

Traverse is a method of surveying in which a sequence of lengths and directions of lines between points on the Earth are measured and used in determining positions of the points. This method is one of several used to find the accurate geodetic positions which various agencies use. Traversing is a convenient, rapid method for establishing horizontal control. The theoretical background is provided here to explain the method of traverse station position computations and adjustments in the Universal Transverse Mercator grid coordinates. Closed traverse station positions were computer and adjusted using the Approximate Method and by the Least Squares Method computer program. The adjusted coordinates of both methods were transformed from the Universal Transverse Mercator grid coordinates to geographic coordinates and compared with the coordinates which were adjusted by the U.S. National Ocean Service.

535,924
AD-A153 678/4/GAR PC A03/MF A01
Range Commanders Council, White Sands Missile Range, NM. Data Reduction and Computing Working Group.
Global Coordinate System.
Feb 85, 45p Rept no. DR/CWG-1515-85
Supersedes AD-782 679.

The purpose of this document is to define and briefly discuss coordinate systems commonly employed at test ranges as well as to recommend procedures and practices for the use of a global coordinate system. This document is primarily intended for use by individuals familiar with the basic concepts and definitions commonly employed in geodesy. In order to aid the reader who requires additional background information, a bibliography of some of the standard texts on geodesy, map projections, and spherical astronomy is provided.

535,925
DE85780461/GAR PC A03/MF A01
European Organization for Nuclear Research, Geneva (Switzerland).
Automation by Microprocessor of an Geodesic Distance Measuring Instrument: The Distinvar.
G. Bain, C. Bore, W. Coosemans, J. Dupont, and J. P. Fabre. 25 Jun 84, 35p CERN-84-07
In French.
U.S. Sales Only.

The distinvar is an instrument for the precision measurement of distances up to 50 m. This report describes the latest developments at CERN which have improved its resolution to 2 micrometers and increased its speed of use. Measurements are automated by incorporating a microcomputer programmed in BASIC. (Atomindex citation 15:073226)

535,926
PB85-187086/GAR PC E04
Institute of Geological Sciences, London (England).
Overseas Geology and Mineral Resources. Number 60: A Gravity Survey of Lesotho,
A. J. Burley, G. S. Kimbell, D. J. Patrick, G. Turnbull, and R. Kashambuzi. c1982, 32p ISBN-0-11-884222-6
See also PB84-206242.

A total of 767 gravity stations have been established in a regional gravity survey of Lesotho. Elevations were measured using altimeters and helicopter transport was used over a large proportion of the country. Data collection and processing are described in this report and the results are presented in the form of contoured Bouguer and isostatic gravity anomaly maps which incorporate surrounding South African data. Anomaly correlation analysis suggests a mean density of about 2.75 g/cc for the Drakensberg basalt. Possible causes for the main gravity anomaly features are discussed with reference to rock densities and structural hypotheses. It appears that compositional and topographic variations in the Precambrian basement have a strong influence on the anomaly pattern: in particular a major anomaly 'high' in the center of the country is likely to be due to basic basement rocks rather than to a thickening of the Drakensberg basalt. The maps reveal a strong SW-NE structural trend. (Copyright (c) Crown Copyright 1982.)

535,927
PB85-187094/GAR PC E04
Institute of Geological Sciences, London (England).
Regional Gravity Anomalies. 1 Northern Britain,
R. G. Hipkin, and A. Hussain. c1983, 50p ISBN-0-11-884235-8, REPT-82/10

This report describes the first part of a project to extract and analyze regional gravity anomalies for the British Isles, using them to identify variations in basement density or structure. It deals generally with methods of data preparation, storage, retrieval, and analysis, and specifically with gravity anomaly maps of northern Britain and their interpretation. (Copyright (c) Crown Copyright 1983.)

8F. Geography

535,928
PB85-188076/GAR PC A05/MF A01
Texas A and M Univ., College Station.
Texas Barrier Islands Region Ecological Characterization Atlas: Socioeconomic and Natural Features Narrative,
C. T. Kimber, K. L. White, and F. S. Hendricks. Feb 84, 90p FWS/OBS-82/15, MMS-84-0005-15
See also PB85-188019.

This report is a descriptive explanation of data presented on 16 maps (maps not available from NTIS) produced at a scale of 1:100,000 for the Texas Barrier Islands Region from the eastern end of East Bay, Chambers County, Texas, to the Texas-Mexico border. Topics mapped include conservation, recreation, and preservation areas; point source discharges; public lands; historical sites; archaeological areas; dredge disposal areas; and highways, waterways, and railroads.

8G. Geology and Mineralogy

535,929
DE85009668/GAR PC A03/MF A01
Lawrence Livermore National Lab., CA.
Strength and Static Elastic Moduli of Mesaverde Rocks.
W. Lin. Mar 85, 32p UCID-20370
Contract W-7405-ENG-48

This report discusses the mechanical properties of Mesaverde rocks (shale and sandstone) from various depths in five wells in Colorado and Wyoming. The properties studied were tensile strength, compressive strength, hydrostatic compressibility, shear stress under strain-controlled compression, and static elastic moduli. With respect to these properties, the sandstones are virtually isotropic. The shales, on the other hand, are definitely anisotropic. The nature and degree of anisotropy of the shales vary with the depth of sample origin. The relative values of mechanical properties between the shale and the sandstone also vary with depth. 7 references, 17 figures, 8 tables. (ERA citation 10:023181)

535,930
NUREG/CR-3178/GAR PC A05/MF A01
Weston Observatory, MA.
Structural and Tectonic Studies in New York State. Final Report July 1981 - June 1982.
Technical rept.,
Y. W. Isachsen. Apr 85, 86p
Contract NRC-04-74-328
Prepared in cooperation with New York State Geological Survey/State Museum, Albany.

Subjects treated in this report include the distribution, trends, exposure characteristics, aeromagnetic signatures, and detailed geometries of fracture systems, as well as tentative inferences concerning relative ages and causes of reactivation. Stress indicators are discussed, and a beginning is made at working out regional paleostress directions using the attitudes of dated mafic dikes. Attempts at defining Holocene and recent crustal movements using geological, geodetic, and seismological methods are reviewed, as well as attempts to relate projected focal mechanism solutions to ground geology. Finally, the distribution of earthquakes and their relationships to geology is reviewed.

535,931
PB85-185270/GAR PC A02/MF A01
Bureau of Mines, Avondale, MD. Avondale Research Center.
Phase Relationship of Talc and Amphiboles in a Fibrous Talc Sample.
Rept. of investigations/1985,
R. L. Virta. 1985, 18p BUMINES-RI-8923
Library of Congress catalog card no. 84-600272.

The Bureau of Mines examined a fibrous talc sample from the Gouverneur talc district in New York by transmission electron microscopy (TEM) and polarized light microscopy to determine the mineralogical relationship of the fibrous talc to the amphiboles present in the sample. Because of various characteristics, phase

contrast microscopy and a provisional TEM technique for monitoring asbestos exposure would not distinguish between fibrous talc and fibrous amphiboles. TEM techniques employing electron diffraction and energy-dispersive X-ray analysis are recommended to positively identify the fibrous phases for regulatory purposes.

535,932
PB85-191765/GAR PC **A04**/MF **A01**
Soil Conservation Service, Washington, DC. Engineering Div.
Graphical Solutions of Geologic Problems.
Final rept.,
D. H. Hixon. Mar 69, 64p SCS/ENG/TR-41

This technical release covers some of the basic techniques in graphical solutions of three dimensional problems involving points, lines and planes. These techniques will give attitude, location, distance, and dimensions in the solution. Techniques for using hemispherical nets for the solution of problems are also covered. These techniques give attitudes and direction, but do not provide distance and dimension in the solutions. A detailed discussion of orthographic and stereographic projections is presented. Example problems include, a three point problem, displacement of vertical and inclined faults, true dip from two apparent dips, rotation of a bed or fault, vertical and inclined drill holes, and a combination orthographic and stereographic technique.

8H. Hydrology and Limnology

535,933
PB85-183994/GAR PC **A13**/MF **A01**
Black Hills Council of Governments, Rapid City, SD.
Nationwide Urban Runoff Program. Urban Runoff Control in Rapid City, South Dakota: Appendix A.
Final rept. 1978-83,
L. Harms, M. Smith, and K. Goddard. Sep 83, 293p
Contract EPA-P-008291-01-0
See also PB85-102366. Prepared in cooperation with South Dakota School of Mines and Technology, Rapid City, SD. Dept. of Civil Engineering.

This document includes a description and collation of data obtained during the investigation of precipitation runoff and it's effects on Rapid Creek in Rapid Creek South Dakota. Information on quality assurance/control is also included.

535,934
PB85-185916/GAR PC **A05**/MF **A01**
National Water Well Association, Worthington, OH.
Enforcement of Regulations Governing Ground Water Contamination from Underground Injection or Disposal of Salt Water in Kansas and Texas.
Final rept.,
L. Aller, R. G. Hakundy, and D. M. Nielsen. Apr 85, 86p EPA/600/2-85/034
Prepared in cooperation with East Central Oklahoma State Univ., Ada.

This document describes in detail the UIC programs relating to Class II wells that have been developed in the states of Texas and Kansas. The UIC program regulations, the individual agency administrative procedures and the methods of handling groundwater contamination incidents resulting from the injection or disposal of salt water are discussed. In addition, several case studies of contamination caused by Class II wells are detailed.

8I. Mining Engineering

535,935
DE84901495/GAR PC **A05**/MF **A01**
McIntyre Mines Ltd., Calgary (Alberta).
Longwall Demonstration in Western Canadian Coals. Phase 1. The Planning and Systems Engineering. Volume 2. Appendices, McIntyre References.
14 Jan 83, 91p NP-4901495
U.S. Sales Only. Portions of this document are illegible in microfiche products.

The essential requirement for successful longwall mining is compatibility between the mining equipment and mining conditions to be encountered. Accordingly, it is necessary to acquire and interpret the site specific data upon which the equipment specifications can be based. Data derived from exploration activity can be analyzed and interpreted to provide information on major faults, seam continuity, seam thickness and general structure. However, drilling programs cannot define minor faults or rolls and these minor deviations could have an adverse effect on longwall operation. To minimize this possibility, the retreating longwall system can be adopted. With this system, roadways spaced at the planned face width are driven to a pre-determined boundary. The roadways are then connected to form the longwall face. In this manner the maximum amount of geologic information is obtained by blocking out the panels prior to longwall operation. The face equipment is then installed and the longwall retreated between the roadways. If minor disturbances are detected during development, plans can be modified to negotiate the disturbances when the pane retreats. In this way, equipment utilization can be maximized and high safety standards maintained. McIntyre will provide Canmet with a detailed technical assessment of the planning and system design for a longwall installation. This assessment will be site specific to No. 9-G Mine at McIntyre's Smoky River operation and will be related to the operation and installation of a series of longwall retreat mining panels. The scope of the work that will be undertaken related to geology, mine planning, system design and procurement is given. (ERA citation 10:019799)

535,936
DE84901496/GAR PC **A12**/MF **A01**
McIntyre Mines Ltd., Calgary (Alberta).
Longwall Demonstration in Western Canadian Coals. Phase 1. Mine Planning and Systems Engineering. Volume 4. Appendices - Longwall Equipment.
14 Jan 83, 268p NP-4901496
U.S. Sales Only. Portions of this document are illegible in microfiche products.

No abstract available.

535,937
DE84901589/GAR PC **A10**/MF **A01**
McIntyre Mines Ltd., Calgary (Alberta).
Longwall Demonstration in Western Canadian Coals. Phase 1. Mine Planning and Systems Engineering. Volume 3. Appendices - Consultants Reports.
14 Jan 83, 219p NP-4901589
U.S. Sales Only. Portions of this document are illegible in microfiche products.

This volume contains consultant reports on the geology, tectonic shear zones and borehole well logging by gamma, density, caliper and focused resistivity methods, including pertinent analysis of these well logs. (ERA citation 10:019802)

535,938
DE84901593/GAR PC **A04**/MF **A01**
British Columbia Univ., Vancouver. Dept. of Mechanical Engineering.
Determination of the Likelihood of the Inflammation of Methane Atmospheres and/or Coal Dust Layers by Components of Mobile Diesel Powered Equipment Which Are Subject to Frictional or Impact Heating.
N. G. Eley. 1979, 66p NP-4901593
U.S. Sales Only. Portions of this document are illegible in microfiche products.

This report describes the use of diesel engines in underground mining - type of equipment, manufacturers, and the regulations under which such equipment operates in various countries. The report specifically investigated the potential risk of inflammation of oily coal dust layers and/or methane atmospheres by frictional heating in impact of: (1) normal use of the starter engagement system used on mobile diesel powered mining equipment; (2) abnormal use of the starter: (i) in attempting to start a seized engine; and (ii) in attempting to start a running engine; (3) normal operation of drum and disc brakes in maximum underground gradients; (4) abnormal operation of drum and disc brakes (dragging pad or shoe); (5) normal clutch operation; and (6) abnormal clutch operation. These subjects were considered in detail. 14 references. (ERA citation 10:019803)

535,939
DE85780528/GAR PC **A09**/MF **A01**
Ontario Ministry of Natural Resources, Toronto.
Ontario's Uranium Mining Industry. Past, Present and Future.
O. J. C. Runnalls. Jan 81, 200p MPBP-13
U.S. Sales Only.

This report traces the Ontario uranium mining industry from the first discovery of uranium north of Sault Ste. Marie through the uranium boom of the 1950's when Elliot Lake and Bancroft were developed, the cutbacks of the 1960s, the renewed enthusiasm in exploration and development of the 1970s to the current position when continued production for the domestic market is assured. Ontario, with developed mines and operational expertise, will be in a position to compete for export markets as they reopen. The low level of expenditures for uranium exploration and the lack of new discoveries are noted. The report also reviews and places in perspective the development of policies and regulations governing the industry and the jurisdictional relationships of the Federal and Provincial governments. (Atomindex citation 15:062252)

535,940
DE85780680/GAR PC **A08**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
Kvanefjeld Uranium Project. Draft Project. Mining and Processing Plant.
G. Erlendsson, J. Jensen, S. Kofoed, and J. L. Paulsen. Nov 83, 163p INIS-mf-9461
In Danish.
U.S. Sales Only.

The draft uranium project "Kvanefjeld" describes the establishment and operation of an industrial plant for exploiting the uranium deposit at Kvanefjeld. The draft project is part of the overall pre-feasibility project and is based on its results. The draft project includes two alternative locations for the processing plant and the tailings deposit plant. The ore reserve is estimated at 56 million tons with an average content of 365 PPM. The mine will be established as an open pit, with a slope angle of 55deg. Conventional techniques are used in drilling, blasting and handling the ore. Waste rock with no uranium content will be disposed of in two ponds near the mine. The waste rock volume is estimated at 80 million tons. A processing plant for extracting uranium from the ore will be established. The technical layout of the plant is based on the extraction experiments performed at Risoe from 1981-83. Yearly capacity is 4.2 million tons of ore. Electrical energy will be supplied from a hydroelectric station to be built at Johan Dahl Land. Thermal energy (steam/heat) will be supplied from a coal-fired district heating plant to be built in connection with the processing plant. Expected power consumption is estimated at 225 GWh/year. Heat consumption is of the same order. In the third year the plant is expected to operate at full capacity. Operating costs will be Dkr. 121/ton of ore from years 1 through 7. Consumption of chemicals will be reduced from the 7th year, and operating costs will consequently drop to Dkr. 115/ton of ore. Calculations show that industrial extraction of the uranium deposit in Kvanefjeld is economically advantageous. In addition, the economy of the project is expected to improve by extracting byproducts from the ore. (Atomindex citation 15:069474)

535,941
EUR-9325/GAR PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Progettazione e Realizzazione diSonde per Rilievi in Pozzi Profondi con Alta Temperaura (Planning and Execution of Survey Probes in Deep Wells at High Temperature).
c1984, 36p EUR-9325-IT
Text in Italian with English summary.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The report presents a complete description of a temperature logging tool for high temperatures, that utilizes glass fiber transmission. Engineered for field use, the prototype was tested at length both in the laboratory, at the maximum operating limits, and in wells, so far at rather shallow depths (800 m). Well testing was possible thanks to a specially developed system enabling the moving in and out of the tool without twisting the cable. The optical cable that was designed and tested is approximately 960 meters long, the maximum length

permitted by the fiber, housed in a flexible stainless steel hose with double outer stranding of INCOLOY. Three other cable lengths are being constructed. When they become available they will enable the system to operate at up to 3500 meters, permitting testing in more critical conditions. The probe is designed for temperature measurements at up to 500C, with pressures up to 500 bar.

535,942
PB85-185304/GAR PC **A02/MF A01**
Bureau of Mines, Rolla, MO. Rolla Research Center.
Upgrading Domestic High-Iron Chromite Concentrates by Carbonyl Extraction of Excess Iron.
Rept. of investigations/1985,
A. Visnapuu, and W. M. Dressel. 1985, 24p
BUMINES-RI-8920
Library of Congress catalog card no. 84-600252.

The Bureau of Mines has upgraded high-iron domestic chromite concentrates by a carbonyl process. The upgraded chromite concentrates show as much as 10 wt pct higher Cr2O3 content and up to a threefold increase in the Cr:Fe ratio, compared with the starting concentrates. The high-iron chromites were first reduced to convert the iron oxides to the metal, and then treated with CO at elevated pressures and low temperatures to convert part of the metallic iron fraction to iron pentacarbonyl. Carbonylation was accelerated by the addition of H2S in small quantities. The iron pentacarbonyl was extricated from the concentrate in the pressure reactor during carbonylation by a CO sweep through a pressure-reducing valve and passed through a decomposer at atmospheric pressure to convert it back to iron metal and CO. CO pressure, temperature, promoter trends, and other factors enhancing iron pentacarbonyl formation are presented.

535,943
PB85-185767/GAR PC **A05/MF A01**
Pennsylvania State Univ., University Park. Dept. of Mineral Engineering.
Sensitive Ground-Fault Protection for Mines. Phase 1. Alternating-Current Utilization.
Open file rept.,
L. A. Morley, F. C. Trutt, and T. Novak. Sep 84, 90p
BUMINES-OFR-26-85
Contract J0134025

The report concerns the research and development of sensitive ground-fault relays for ac utilization systems in mining. Sensitive relaying employs very low pickup levels such that, when used in conjunction with very high resistance grounding, the exposure of a human to ventricular fibrillation is significantly reduced. To delineate the desired relay characteristics, the report commences by reviewing and updating previous research in this area. The critical relay component for sensitive ground-fault relays has been found to be the current transformer; their theory and design are detailed. Electronics for two prototype relays have been produced through the research and information is presented so that either may be duplicated.

535,944
PB85-186831/GAR PC **A03/MF A01**
Pennsylvania State Univ., University Park.
Physiological Responses of Miners to Emergency. Volume 1. Self Contained Breathing Apparatus Stressors.
Open file rept.,
E. Kamon, N. S. Deno, and M. Vercruyssen. Oct 84, 31p BUMINES-OFT-29(1)-85
Contract J0100092
See also PB85-186849.

This report summarizes completed research pertaining to the reaction of human subjects exposed to self-contained breathing apparatus stressors during escape conditions (resistance breathing, CO2 breathing, hot air breathing, and static positive facepiece positive pressure breathing) and the development of an automated breathing and metabolic simulator. Volume I contains summaries of the studies performed.

535,945
PB85-186849/GAR PC **A09/MF A01**
Pennsylvania State Univ., University Park.
Physiological Responses of Miners to Emergency. Volume 2. Appendices.
Open file rept.,
E. Kamon, N. S. Deno, M. Vercruyssen, J. B. Sheehy, and D. Kiser. Oct 84, 180p BUMINES-OFR-29(2)-85
Contract J0100092
See also PB85-186831.

This report summarizes completed research pertaining to the reaction of human subjects exposed to self-contained breathing apparatus stressors during escape conditions (resistance breathing, CO2 breathing, hot air breathing, and static positive facepiece positive pressure breathing) and the development of an automated breathing and metabolic simulator. Volume II, the appendix, contains detailed descriptions of the studies performed.

535,946
PB85-186134/GAR PC **A05/MF A01**
Texas A and M Univ., College Station.
Texas Barrier Islands Region Ecological Characterization Atlas: Mineral Resources and Selected Oil and Gas Infrastructures Narrative,
C. T. Kimber, K. L. White, and F. S. Hendricks. Feb 84, 99p FWS/OBS-82/17, MMS-84/0005
Contract DI-14-16-0009-79-126

This report is a descriptive explanation of data presented on 16 maps (maps not available from NTIS) produced at a scale of 1:100,000 for the Texas Barrier Islands Region from the eastern end of East Bay, Chambers County, Texas, to the Texas-Mexico border. Topics mapped include pipelines, refineries, gas processing plants, oil and gas storage facilities, helicopter ports, and dock (port) facilities.

535,947
PB85-193787/GAR PC **A17/MF A01**
Kentucky Univ., Lexington. Inst. for Mining and Minerals Research.
Influence of Continuous Miner Bit Sharpness and Coal Lithotype Composition on Coal Breakage: Examples from Kentucky Mines.
Technical rept.,
G. T. Lineberry, F. D. Rogers, J. W. Leonard, J. C. Hower, and A. M. Graese. c1984, 394p IMMR84-121
Sponsored by Kentucky Energy Cabinet, Lexington.

This pilot study addresses the influence of coal lithotype, continuous miner bit sharpness, and coal hardness on particle sizing and liberation characteristics. The interface of the 'job end' of the traditional continuous mining machine and the given geologic conditions at the job site; and their combined influence on particle sizing and liberation is investigated.

535,948
PB85-861748/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Pressure Regulating Valves: Petroleum and Natural Gas Industries. 1976-May 1985 (Citations from the Energy Data Base).
Rept. for 1976-May 85.
Jun 85, 128p
Supersedes PB83-866822. Prepared in cooperation with Department of Energy, Washington, DC.

This bibliography contains citations concerning valve control systems and equipment in petroleum and natural gas industries. Pressure and flow control valve designs for oil and gas well drilling, stimulation, serving and logging; and the storage of oil and gas are discussed. Valve mechanism and arrangement, safety valve design, and remote control of valves are presented. (This updated bibliography contains 161 citations, 92 of which are new entries to the previous edition.)

8J. Physical Oceanography

535,949
AD-A153 582/2/GAR PC **A03/MF A01**
Washington Univ., Seattle. Polar Science Center.
Artic Mixed Layer Dynamics.
Final rept.,
J. Morison. Feb 85, 40p
Contract N00014-83-K-0115

Contents: Seasonal Variations in the Upper Artic Ocean as Observed at T-3: Hydrographic data from T-3 are analyzed to illustrate the behavior of the Artic mixed layer. The mixed layer depth fluctuates 11 m annually and mixed layer salinity fluctuates 0.32% ppt. The fluctuations in total salt content are consistent with theoretical work by Maykut and are in phase with mixed layer depth, indicating changes in the mixed layer are controlled by salt flux. Oceanographic Conditions in the Marginal Ice Zone North of Svalbard in Early Fall 1979 with an Emphasis on Mesoscale Processes: During September-October 1979 the Norwegian Remote Sensing Experiment was carried out in the marginal ice zone north of Svalbard. Convergence of the ice cover is correlated with along-ice edge winds with the ice to the right, while divergence occurs during off-ice winds or calm conditions. The Fram 3 Expedition: On the fourteenth of March 1981, Fram 3 the third in a series of four U.S. manned ice camps, was established in the eastern Arctic Ocean at 84.32 N, 20.07 E for studies of physical and chemical oceanography, low-frequency underwater acoustics, geophysics, and the mechanics and propagation of waves through sea ice. Salargos Temperature-Conductivity Buoys: The design and testing of buoys capable of measuring temperature and salinity in ice covered oceans is described. The buoys are implanted in the sea ice and collect water temperature and conductivity data from pairs of sensors tethered to a cable suspended below the ice. The sensor data is collected and position is determined using the ARGOS satellite system.

535,950
AD-A153 765/3/GAR PC **A03/MF A01**
Naval Ocean Research and Development Activity, NSTL Station, MS.
Operation Guiding Light-Scientific Program and Field Plan. The Pilot Field Experiment for NORDA Project Chemical Dynamics in Ocean Frontal Areas.
Final rept.,
D. A. Wiesenburg. Mar 85, 41p Rept no. NORDA-TN-308

This document describes the scientific program and field plan for operation GUIDING LIGHT, the pilot field experiment for the NORDA project Chemical Dynamics in Ocean Frontal Areas. The study area for GUIDING LIGHT is the western North Atlantic Ocean off the eastern coast of the United States. The operation will be conducted from 18 April to 10 May 1985. The fronts to be examined during this pilot experiment are the Gulf Stream front and shelf-slope front off New England. GUIDING LIGHT will employ rapid sampling and analytical capabilities to measure chemical-biological-physical variations in surface waters at these frontal boundaries, Both shipboard and remotely sensed observations will be made. The field operation will be conducted from one ship (USNS BARTLETT), three aircraft, and the space shuttle (STS 51-B). Participates in GUIDING LIGHT include investigators from the Naval Ocean Research and Development Activity, the National Aeronautics and Space Administration, University of California, Texas A & M University, Old Dominion University, Florida State University, University of Southern Mississippi, and the University of Texas.

535,951
PB85-180156/GAR PC **E06/MF E06**
Water Research Centre, Stevenage (England).
Quantities of Some Heavy Metals Entering the North Sea.
Technical rept.,
J. M. Hill, G. Mance, and A. R. O'Donnell. c1984, 28p TR-205

The quantities of certain toxic substances discharged to UK coastal waters were recently the subject of a comprehensive survey. The results of this survey provided an objective assessment of the quantities of eight heavy metals entering the North Sea. The magnitude of the inputs of toxic substances to the North Sea are subject to considerable debate and this report presents the estimates for the UK. Furthermore the approach developed in the UK survey has been extended to the other North Sea countries and when linked with published information has enabled the estimation of the quantities of these metals entering the North Sea from all of the boundary countries. These estimated quantities are presented and contrasted with previous estimates. Data on industrial discharges were only available for the Netherlands and the United Kingdom. (Copyright (c) Water Research Center, 1984.)

535,952
PB85-183168/GAR PC **E03/MF E03**
Institute of Oceanographic Sciences, Wormley (England).

RRS CHALLENGER Cruise 6/84, August 31-September 1984, Mooring Recovery in Faeroe-Shetland Channel and Mooring Deployment and Associated Work on Porcupine Slope,
S. A. Thorpe. 1984, 18p IOS/CRUISE-167

The Cruise objectives were to: Recover 6 moorings from west Shetland slope; deploy high resolution resistance thermometer chain (BERTHA) at foot of Porcupine Bank; set 4 moorings in the area; CTD survey across the continental slope between 1000 and 4500m contours; Recover a bathysnap from the Porcupine Seabight; Deploy inverted echo sounder (ARIES) near the UK data buoy DB2.

535,953
PB85-183176/GAR PC **E03**/MF **E03**
Institute of Oceanographic Sciences, Wormley (England).
Geochemical Sampling in the North Atlantic, June 15-July 10, 1984,
T. R. S. Wilson. 1984, 24p IOS/CRUISE-149, CRUISE-169

This cruise is part of a background environmental research program related to the Heat Generating Radioactive Waste study. The main work area is designated 'GME', on the Madeira Abyssal Plain close to 31 deg. 30 sec. N 35 deg. W. Scientific objectives were: To obtain sediment and pore water samples from five designated stations within the study area; to supplement this by deeper sampling at the same station using the IOS piston corer; to make shipboard analytical studies on this material in order to define the chemical (redox) state of the sedimentary environment, and its variation with depth and position within the study area; surficial sediment dissolved oxygen profiles in the abyssal Atlantic off the Porcupine Sea Bight.

535,954
PB85-189850/GAR PC **E03**/MF **E01**
Nederlands Centrum voor Oceanografische Gegevens, De Bilt.
Sea-Going Measurement Programmes in the Netherlands, 1984,
P. Geerders. Sep 84, 21p
See also PB84-186279.

The seas are the dominating physical features of the Indonesian archipelago. The internationally recognized 'WAWASAN NUSANTARA' (the Archipelago Concept) gives legal framework for Indonesia to exploit and to manage rationally the Indonesian marine resources. In order to realize this plan, scientific marine investigations have to be carried out to assess the potentiality of Indonesian marine resources. The Dutch marine scientific community has given an enthusiastic response to the invitation by submitting an integrated and detailed proposal on the Dutch contribution to the Second Snellius-Expedition. Included in the report are: Geology and geophysics of the Banda Arc and adjacent areas; Ventilation of deep sea basins; Pelagic systems; Coral reefs; River inputs into ocean systems.

8K. Seismology

535,955
AD-A153 859/4/GAR PC **A06**/MF **A01**
Teledyne Geotech, Alexandria, VA. Seismic Data Analysis Center.
Effect of Crustal Structure on Lg.
Technical rept.,
D. W. Rivers. 9 Oct 80, 118p Rept no. SDAC-TR-80-7B
Contract F08606-79-C-0007, DARPA Order-2551

The transverse component of the regional phase L sub g was synthesized by the superposition of higher-order Love-wave modes at frequencies of up to 2.5 Hz. The synthetic seismograms represent the signals which would be generated by earthquakes at various depths in a tectonic shield. Two alternative earth models were also used: one in which the shield structure was overlain by 2 km of low-velocity sediments, and another in which this sedimentary layer was further assumed to be highly attenuating. The synthetics were used to calculate the amplitude-versus-distance relations for L sub g and to analyze its phase-velocity structure as a possible depth discriminant. Keywords include: L sub g attenuation, Synthetic seismogram.

8L. Snow, Ice, and Permafrost

535,956
AD-A153 626/3/GAR PC **A07**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Permafrost, Seasonally Frozen Ground, Snow Cover and Vegetation in the USSR.
Special rept.,
S. R. Bigl. Dec 84, 133p Rept no. CRREL-SR-84-36

A survey of the Cold Regions Science and Technology Bibliography and other references in the CRREL library was conducted to compile recent information about several Soviet physiogeographic features: permafrost, seasonally frozen ground, snow cover and vegetation. The products of the study are 19 a series of maps presenting the general distribution of these features over the entire Soviet Union and 2) a collection of 57 maps showing the local distributrion of ground ice and permafrost.

8M. Soil Mechanics

535,957
AD-A153 690/3/GAR PC **A04**/MF **A01**
Mississippi Univ., University. Physical Acoustics Research Lab.
Study of Sound Attenuation in Sediments.
Final technical rept.,
S. R. Addison, and H. E. Bass. Dec 84, 73p Rept no. PARGUM-84-03
Contract N00014-79-C-0858
Doctoral thesis.

This dissertation describes an experimental method by which the low-frequency attenuation of compressional waves in a sediment may be measured in the laboratory. The Biot and Hamilton models of sound propagation through sediments are reviewed. Measurements of attenuation in one laboratory sediment are presented, and the measured attenuation is compared to the predictions of the Biot and Hamilton models. The functional dependence of the attenuation measurements is of the form predicted by the Biot model, although the actual magnitude of the measured attenuation is higher than expected. The excess attenuation may be explained by the incomplete de-gassification of the sediment.

535,958
AD-A153 808/1/GAR PC **A11**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Hydraulics Lab.
Erosion Control of Scour during Construction. Report 8. Summary Report.
Technical rept. 1 Oct 77-30 Sep 84,
L. Z. Hales. Jan 85, 230p Rept no. WES/TR/HL-80-3-8
See also AD-A148 102.

When major stone structures such as jetties, breakwaters, or groins are erected in the coastal zone, they alter the existing tidal, wave-induced, or wind-driven currents that are in a dynamic equilibrium with the existing bathymetry. These altered currents and waves breaking on such structures under construction may change the existing bathymetry by causing bottom material to be suspended and transported from the region. The objectives of this research were to develop techniques and knowledge for estimating resulting wave characteristics and wave-induced current fields in the vicinity of major coastal structures. Both analytical and laboratory experimental studies were conducted during the investigation. The analytical developments regarding wave heights and wave-induced currents were verified by the use of precise experimental studies of shore-connected breakwaters. Additional underlayer stability experimental studies were conducted for estimating the size of stone comprising the foundation bedding material which would remain stable under various wave conditions. Originator-supplied keywords: Breakwaters, Coastal engineering, Hydraulic structures, Scour (Hydraulic engineering), Shore protection, Water waves.

535,959
AD-A153 927/9/GAR PC **A05**/MF **A01**
Itasca Consulting Group, Inc., Minneapolis, MN.
Development of Generalized 2-D and 3-D Distinct Element Programs for Modeling Jointed Rock.
Final rept.,
P. A. Cundall, and R. D. Hart. Jan 85, 83p WES/MP/SL-85-1
Contract DACA39-82-C-0015
Supplement to AD-A087 610.

The capabilities of the UDEC computer program have been improved to provide full generality of the program for modeling jointed rock. Complete features exist for simulating variable rock deformability, nonlinear behavior of distinct joints and intact rock, dynamic cracking, projectile impaction, and fluid flow and fluid pressure generation in joints and voids. Further, the first stage in the development of a three-dimensional distinct element code has been completed. A new data structure has been designed and a test-bed code produced for three-dimensional analysis.

535,960
PB85-191468/GAR PC **A04**/MF **A01**
California Univ., Richmond. Earthquake Engineering Research Center.
Moduli and Damping Factors for Dynamic Analyses of Cohesionless Soils,
H. B. Seed, R. T. Wong, I. M. Idriss, and K. Tokimatsu. Sep 84, 51p UCB/EERC-84/14, NSF/CEE-84025
Grant NSF-CEE81-10734
Errata sheet inserted. Prepared in cooperation with Allstate Geotechnical Services, San Francisco, CA., and Woodward-Clyde Consultants, Santa Ana, CA. See also PB85-191732.

This report reviews available information on the dynamic shear moduli and damping factors for sands, presents new data on similar properties for gravels, and presents the results in a form which will provide a useful guide in the selection of soil characteristics for analysis purposes.

535,961
PB85-191732/GAR PC **A04**/MF **A01**
California Univ., Richmond. Earthquake Engineering Research Center.
Influence of SPT (Standard Penetration Test) Procedures in Soil Liquefaction Resistance Evaluations,
H. B. Seed, K. Tokimatsu, L. F. Harder, and R. M. Chung. Oct 84, 62p UCB/EERC-84/15, NSF/CEE-84026
Grant NSF-CEE81-10734
See also PB85-191468. Sponsored by National Bureau of Standards, Gaithersburg, MD.

This report attempts to clarify the meaning of the values of standard penetration resistance used in correlations of field observations of soil liquefaction with values measured in the Standard Penetration Test (SPT) tests. The field data is re-interpreted and plotted in terms of a newly-recommended standard determined in SPT tests. Energies associated with different methods of performing SPT tests in different countries and with different equipment are summarized and can readily be used to convert any measured N-value to the standard value. Liquefaction resistance curves for sands with different N-values and with different fines contents are proposed; these are believed to be more reliable than previous curves expressed in terms of mean grain size. Finally, suggestions are made concerning the significance of the term 'liquefaction'.

535,962
PB85-192979 Not available NTIS
Colorado State Univ., Fort Collins. Dept. of Agronomy.
Solid Phase Formation and Solution Chemistry of Nickel in Soils: 2. Experimental.
Journal article,
M. Sadiq, and C. G. Enfield. c1984, 7p EPA/600/J-84/277
See also PB85-192987.
Pub. in Soil Science, v138 n5 p335-340 Nov 84.

Based on the thermodynamic stability models of Ni minerals, NiFe2O4 (nickel ferrite) and Ni3(PO4)2 seem the most probable solid phases that could form in soils during Ni sorption. An earlier study showed that the sorption of Ni in different soils was significantly correlated to suspension pH, total Fe, and surface area, but was poorly correlated to the cation exchange capacity of the soils studied. The objective of this research was to investigate the probability of Ni solid phase formation in soils.

535,963
PB85-192987 Not available NTIS
Colorado State Univ., Fort Collins. Dept. of Agronomy.
Solid Phase Formation and Solution Chemistry of Nickel in Soils: 1. Theoretical.
Journal article,
M. Sadiq, and C. G. Enfield. c1984, 10p EPA/600/J-84/276
See also PB85-192979.
Pub. in Soil Science, v138 n4 p261-270 Oct. 84.

Nickel (Ni) may be an environmental pollutant. It is phytotoxic as well as zootoxic, especially to marine life. It results in carcinogenesis and many other metabolic complications. The main sources of environmental contamination of Ni are nickel refineries, industrial and municipal wastes, and auto emissions. No matter what the sources of environmental contamination, soils and sediments are the ultimate receptacles of Ni. Nickel is introduced into human and animal food chains mainly through water and plants. One way of understanding the chemical behavior of Ni in soils is by simulating thermodynamic stability models of various Ni minerals and solution species in soils. The objectives of this paper are to develop such stability models of probable Ni minerals and solution species in soils and to discuss their role in a soil environment.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

535,964
AD-A153 409/8/GAR PC **A19/MF A01**
Centre National de la Recherche Scientifique, Bellevue (France).
European Solid State Device Research Conference including Solid State Device Technology (14th) ESSDERC 84 Held at Lille, France on 10-13 September 1984,
G. T. Geneva. Sep 84, 444p

Contents: Organizing and Program Committees; Communications and publications; General informations; Timetable and program; Abstracts; and Authors index.

535,965
AD-A153 432/9 Not available NTIS
Dayton Univ., OH. Research Inst.
Development of High Energy Product Permanent Magnets from 2:17 RE-TM Alloys,
A. E. Ray. Sep 84, 6p ARO-21026.2-MS
Contract DAAG29-84-K-0012
Availability: Pub. in IEEE Transactions on Magnetics, vMAG-20 n5 p1614-1618 Sep 84 (No copies furnished by DTIC/NTIS).

The remanence, Br, of sintered 2:17 RE-TM permanent magnets depend on saturation magnetization, Ms, particle alignment, and packing density. Methods to estimate upper bounds for Ms and energy product, (BH)max, as a function of composition are presented. As Br is limited by processing variables, (BH)max is limited by intrinsic coercivity, MHC, and loop squareness. The coercivities of the 2:17 RE-TM permanent magnets are controlled by the alloy microstructures and the compositions of the phases comprising these microstructures. Some aspects of the response of these alloy systems to compositional and heat treating variables are discussed in light of a model proposed for their metallurgical behavior. Magnetic circuits under consideration for micro- and millimeter wave tubes call for permanent magnets with energy products greater than 30 MGOe and nearly zero temperature coefficients between -50 C and 200 C, Permanent magnets which combine these properties are not presently available.

535,966
AD-A153 436/1/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Calculation of the Capacitance-Voltage Characteristics of p+-InP/n-InP/n-InGaAsP Photodiodes.
Journal article,
J. P. Donnelly. 16 Jun 81, 10p JA-5250, ESD-TR-85-047
Contract F19628-80-C-0002
Pub. in Solid State Electronics, v25 n7 p669-677 1982.

An analytic solution for the capacitance-voltage characteristics of p(+)-InP/n-InP/n-InGaAsP diodes has been obtained. The solution, which closely approximates that obtained using numerical methods, indicates that the dip followed by a peak generally observed in the effective carrier concentration profile as derived from experimental capacitance measurements is likely due to the properties of the n-n heterojunction rather than actual variations in the doping concentration. The availability of the analytic solution greatly facilitates the study of the effects of various parameters on these characteristics. The influence on grading and the collection of holes in the notch formed by the valence band discontinuity is also briefly considered.

535,967
AD-A153 678/8/GAR PC **A08/MF A01**
Southeastern Center for Electrical Engineering Education, Inc., St. Cloud, FL.
Basic EMC (Electromagnetic Compatibility) Technology Advancement for C3 Systems. Volume 4D. Modeling Crosstalk in Balanced Twisted Pairs.
Final technical rept.,
D. A. Koopman, and C. R. Paul. Aug 84, 166p
RADC-TR-82-286-VOL-4D
Contract F30602-81-C-0062
See also Volume 4E, AD-A150 652 and Volume 4F, AD-A153 679.

Electrical devices (computers, radar systems, communication radios, etc.) are interconnected by wires on most present systems. Electromagnetic fields produced by the excitation of these wires will cause unintentional coupling of signals onto nearby wires. This undesired electromagnetic coupling is termed crosswalk. It is important to be able to determine whether these crosstalk signals will cause the devices at the ends of the wires to malfunction. Wires are often grouped together in cable bundles or harnesses. The close proximity of wires in these bundles enhances the possibility that the crosstalk levels will be sufficiently large to cause malfunctions. The ability to predict crosstalk levels and the means to control crosstalk when it causes a problem are important to optimum system design. If interference of this type is allowed to surface during final system tests, a costly and time consuming retrofit of the wiring or the addition of filters and other interference control measures may be required.

535,968
AD-A153 726/5/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Losses in Coplanar Waveguides.
Journal article,
A. Gopinath. Jul 82, 5p JA-5298, ESD-TR-85-057
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-30 n7 p1101-1104 Jul 82.

Conductor losses in coplanar waveguides have been calculated using a quasi-static Green's function approach. These calculations and others on dielectric and radiation losses are used to compute the quality factor of half-wavelength resonators, and comparison with measurements show good agreement.

535,969
AD-A153 773/7/GAR PC **A04/MF A01**
RCA, Inc., Ste. Anne de Bellevue (Quebec).
Development of Photodetectors.
Final technical rept. Jun 83-Jun 84,
R. McIntyre, and P. Webb. Jan 85, 54p RADC-TR-84-217
Contract F19628-82-C-0038

Vapour-phase-epitaxial techniques have been used to fabricate InGaAs/InP avalanche photodiodes having a 'SAM' configuration. The APD's are mesa-etched and are unpassivated. Stable operation up to gains of about 10 has been demonstrated. Noise of all units tested has been somewhat high due to a high value of Kerr (about 0.6), and due to high bulk dark currents. Attempts to develop a satisfactory passivation for the mess-etched devices have been largely unsuccessful.

535,970
AD-A153 818/0/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Raman Measurements of Stress in Silicon-on-Sapphire Device Structures.
Journal article,
S. R. J. Brueck, B. Y. Tsaur, J. C. C. Fan, D. V. Murphy, and T. F. Deutsch. 15 May 82, 5p JA-5310, ESD-TR-85-060
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v40 n10 p895-898, 15 May 82.

Spatially resolved (about 1 micrometer) Raman scattering measurements of the Si optical phonon spectrum have been used to map the stress in silicon-on-sapphire device structures. Devices defined by an isolated island etch technique exhibit a stress relaxation extending about 1.5 micrometer from the edges of a 6-micrometer-wide Si stripe. Devices defined by a local oxidation of the Si exhibit a more uniform stress profile.

535,971
AD-A154 032/7/GAR PC **A13/MF A01**
Yale Univ., New Haven, CT.
Research on Gyrotrons.
Final technical rept.,
J. L. Hirshfield. 15 Apr 85, 277p
Contract N00014-80-C-0075

A summary is given of research on gyrotron-like mechanisms for amplifying or generating electromagnetic radiation. These mechanisms include slow-wave cyclotron-wave amplification in a dielectrically-loaded waveguide, cyclotron harmonic oscillations in a quasi-optical millimeter-wave structure, a quasi-optical gyro-klystron, and cyclotron, and cyclotron harmonic amplification in irregular cross section waveguides. Both linearized theory and experimental observations are described.

535,972
DE85009501/GAR PC **A02/MF A01**
Sandia National Labs., Albuquerque, NM.
Summary of Recent Studies on AlGaAs/GaAs Radiation Hardened Photodiodes.
J. J. Wiczer. 1985, 6p SAND-84-2678C, CONF-850345-6
Contract AC04-76DP00789
Southwest conference on optics, Albuquerque, NM, USA, 4 Mar 1985.

In this paper, we summarize the results of several studies assessing the radiation hardness of a new type of double heterojunction, AlGaAs/GaAs photodiode. These studies include transient and permanent damage experiments. Transient studies indicate that double heterostructure AlGaAs/GaAs photodiodes generate 40 times less photocurrent than conventional silicon photodiodes during exposure to ionizing-radiation pulses. Permanent damage studies with neutrons, sup 60 Co gamma rays, and high energy electron beam sources indicate only minor changes in operational characteristics after exposures. These studies have shown a 20% degradation in optical response and a factor of 8 increase in photodiode leakage current after exposure to 3.6 x 10 exp 15 neutron/cm exp 2 fluence. Conventional silicon photodiodes exhibit this type of degradation after exposures to 10 exp 12 to 10 exp 13 neutrons/cm exp 2 fluences. These characteristics are important for many specialized applications requiring radiation hardness. (ERA citation 10:023039)

535,973
PATENT-4 489 264 Not available NTIS
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Power Control for AC Motor.
Patent,
R. W. Dabney. Filed 14 Jun 83, patented 18 Dec 84, 8p N85-22877/3, PAT-APPL-6-504 345
Supersedes PAT-APPL-6-504 345, N83-28329 (21 - 17, p 2743).

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231, $1.00.

A motor controller employing a triac through which power is supplied to a motor is described. The open circuit voltage appearing across the triac controls the operation of a timing circuit. This timing circuit triggers on the triac at a time following turn off which varies inversely as a function of the amplitude of the open circuit voltage of the triac.

535,974
PATENT-4 505 582 Not available NTIS
Department of the Air Force, Washington, DC.
Self-Detecting Optical Sensors.
Patent,
R. Zuleeg, and J. K. Notthoff. Filed 14 Jul 82, patented 19 Mar 85, 9p AD-D011 657/4, PAT-APPL-6-398 134
Supersedes PAT-APPL-6-398 134, AD-D009 767.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

A short-ranging laser system having an improved pulser which includes a drive pulse signal generator and a driver. The drive pulse signal generator is essentially a triggered bipolar avalanche transistor that outputs a drive pulse signal through a voltage shifting circuit to the driver. The driver is essentially two parallel-connected power MOSFETs that output a driver pulse to a GaAs heterojunction laser diode. By circuit design, the deadtime plateau is substantially reduced so that the laser return energy homodynes with the still active laser to produce a detectable output for a target within 5 meters. (Author)

535,975
PB85-183150/GAR PC **E04**/MF **E04**
Electricity Council Research Centre, Capenhurst (England).
Microcomputer-Controlled Transformer Load Monitor,
S. J. Kearley, and F. J. Hogan. Dec 84, 38p ECRC/R-1845

The report describes a microcomputer-based instrument which monitors the current in the three phases of a distribution transformer. The currents are averaged over a thirty minute period, at the end of which the demand is assigned to one of sixteen bands, and the relevant band is updated. Interrogation of the unit gives a histogram of the transformer loading for a period of up to three years. Several such recorders have been in service during 1982-83 with four Area Boards, and the histograms obtained at various sites are shown. These histograms show that a single maximum demand reading is not a good measure of a transformer's load pattern.

535,976
PB85-184885/GAR PC **E03**/MF **E03**
Electricity Council Research Centre, Capenhurst (England).
Polypropylene Sheet on 11 kV Wood Poles,
P. M. Brown, and D. Voas. Jul 84, 17p ECRC/R-1820

South Wales Electricity Board has developed a technique for installing wood poles at midspan positions on live 11 kV overhead lines. During the installation, which may take more than two weeks, the wood pole tops are insulated by 2 mm thick polypropylene sheet. However, during heavy rain the polypropylene has become burnt and this report describes an investigation to determine the cause of the damage to the polypropylene and recommends a solution to the problem.

535,977
PB85-184984/GAR
(Order as PB85-184950/GAR, PC **E05**/MF **E01**)
Toshiba Corp., Tokyo (Japan).
High-Speed Bipolar Transistor Compatible with High-Speed CMOS FET Technology,
H. Iwasaki, H. Takada, and Y. Sugimoto. c1985, 4p
Text in Japanese.
Included in Toshiba Review, v40 n2 p121-124 1985.

Technology regarding the compatibility of high-speed bipolar transistors with high-speed CMOS FETs has been developed to comply with the 3-micrometer rule of the first stage. Employing epitaxial wafers with N(+)-buried layer and having N-well-structure silicon-gate CMOS FET coexisting with doped polysilicon-emitter-structure bipolar transistors, the processes have been commonized and simplified; in addition, the processes have been rendered controllable in the case of mass production. The fT=2 to about 4GHz of bipolar transistors and the (tau sub pd) of 1.2 ns are the important characteristics obtained by this compatible technology. Furthermore, contrivance has also been made for complying with the 2-micrometer rule of the second stage.

535,978
PB85-185676/GAR PC **E04**/MF **E04**
Electricity Council Research Centre, Capenhurst (England).
Diffusion of Water in Cross-Linked Polyethylene Containing Microvoids,
G. J. Le Poidevin. Mar 85, 27p ECRC/M1906

In the report separate theories for the absorption and desorption of water by cross-linked polyethylene (XLPE) are advanced. The rate of water absorption is shown to be dependent on void size and void concentration, whereas the rate of water desorption into dry air is affected only by void concentration. Calculations of diffusion coefficient for void-containing XLPE, in both absorption and desorption modes, are compared with experimental values from the literature, and agreement is good. Finally, the factors which influence the condensation of water in microvoids are critically discussed.

535,979
PB85-185973/GAR PC **E04**/MF **E04**
Electricity Council Research Centre, Capenhurst (England).
Migration of Water from Steam-Cured Cross-Linked Polyethylene into a Desiccant-Loaded Unvulcanised Rubber - Application to 33 kV Single-Core Cable Design,
G. J. Le Poidevin. Mar 85, 28p ECRC/M1930

This report presents a theory of moisture transfer from steam-cured XLPE insulation to an adjacent rubber-like layer containing a calcium montmorillonite desiccant. Excellent agreement is obtained when the theory is compared with experiment. It is shown that at ambient temperature the clustered water formed during manufacture will remain in the XLPE microvoids for up to 4 years, whereas at 80C the insulation will dry out after 1 week. On the other hand a gas-cured XLPE insulation, or an XLPE containing an initially low concentration of condensed water, is likely to become substantially water-free prior to the cable installation.

535,980
PB85-187805 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Behavior of the DC Impedance of an RF-Biased Resistive SQUID.
Final rept.,
D. Van Vechten, R. J. Soulen, and R. L. Peterson. 1980, 4p
Sponsored by Physikalisch-Technische Bundesanstalt, Berlin (Germany, F.R.), and European Physical Society, Geneva (Switzerland).
Pub. in Proceedings of IC SQUID Int. Conference on Superconducting Quantum Devices (2nd), Berlin, Germany, May 6-9, 1980, p186-189.

The authors have measured the dc impedance of an rf biased R-SQUID as a function of applied dc bias current, rf frequency and amplitude, and the critical current of the weak link. They conclude that the inclusion of an rf driving current, as required for parametric upconversion influences, in an as yet incompletely modeled way, the dc impedance of an R-SQUID.

535,981
PB85-201523 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Microprocessor-Based Technique for Transducer Linearization.
Final rept.,
J. V. Moskaitis, and D. S. Blomquist. 1983, 4p
Pub. in Precis. Eng. 5, n1 p5-8 Jan 83.

A linearization technique has been developed at the National Bureau of Standards (NBS) that is applicable to a wide range of transducers with calibration curves containing nonlinear regions. This technique was applied to a microcomputer-based, displacement sensor system that achieve accuracies of 1 part in 4096. By increasing the resolution of the ADC from 12 to 16 bits, a linearization of 1 part in 65,000 can be achieved.

535,982
PB85-861359/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ceramic Capacitors. 1970-May 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-May 85.
Jun 85, 112p

This bibliography contains citations of selected patents concerning the design and fabrication of ceramic capacitors. Materials and methods employed in the manufacture of multilayer, monolithic, semiconducting, high-voltage, and tubular capacitors are discussed. Electrode materials and fabrication methods are presented, as well as techniques used in capacitor testing. Ceramic capacitors designed for electric and electronic devices are considered. (Contains 155 citations fully indexed and including a title list.)

535,983
PB85-862001/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Thick Films: Electronic Applications. 1974-June 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jun 85.
Jun 85, 164p
Supersedes PB84-867175. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the design and application of thick film resistors, conductors and other thick film electronic devices. Thick film anodes for photoelectrochemical solar cells, thick films for optical and infrared radiation conduction, processes of thick film deposition, properties and fabrication of variable thick film devices, and development and testing of thick film conductive inks are among the topics discussed. Applications in military and civilian avionics are considered. (This updated bibliography contains 197 citations, 12 of which are new entries to the previous edition.)

9B. Computers

535,984
AD-A153 408/0 Not available NTIS
Washington State Univ., Pullman. Dept. of Computer Science.
Parallel Processing of Graphs: Some Practical Considerations,
N. Deo. 1985, 5p ARO-18360.13-EL
Contract DAAG29-82-K-0107
Availability: Pub. in Proceedings of the IEEE International Symposium on Circuits and Systems, 1985 (No copies furnished by DTIC/NTIS).

Although a respectable body of theoretical literature has emerged on parallel algorithms for graphs during the last ten years, scant attention has been paid to the real-life issues. These issues include (i) realistically buildable parallel computers with (ii) a bounded number of processors, with (iii) nonzero communication delays and synchronization overheads. Nor has much consideration been given to parallel processing of large weighted, sparse graphs along with suitable data structures for them. In this paper we discuss these issues and problems, which have to be faced while designing parallel programs to solve practical problems on large, sparse networks (i.e. weighted graphs) on general-purpose parallel computers that have been built or are being built. Only tightly-coupled, shared-memory MIMD (multiple instruction stream, multiple data stream) computers seem to fit the bill, at least in the present and the near future.

535,985
AD-A153 421/3/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.

Study of Edge Detection Algorithms.
Journal article,
T. Peli, and D. Malah. 1982, 22p JA-5280, ESD-TR-85-052
Contract F19628-80-C-0002
Pub. in Computer Graphics and Image Processing, v20 p1-20 1982.

Edges are image attributes which are useful for image analysis and classification in a wide range of applications. The numerous applications and the subjective approach to edge definition and characterization have promoted the development of a large number of edge detectors (or operators) which may perform well in given applications but poorly in others. This reprint describes a variety of edge detectors and evaluate their performance in terms of some known performance measures. The study is based on computer similated edges of different shapes, slopes and background noise levels. The performed evaluation together with results in other related works helps to categorize the different edge detection schemes, as well as to better understand the usefulness and limitations of the performance measures used. (Author)

535,986
AD-A153 427/0 Not available NTIS
Stanford Univ., CA. Center for Reliable Computing.
Reliability of the IBM MVS/XA (Extended Architecture).
Technical rept.,
S. Mourad, and D. Andrews. Jan 85, 47p CRC-TR-85-1, CSL-TN-85-259, ARO-18690.15-EL
Contract DAAG29-82-K-0105
Availability: Stanford Univ., CA. Center for Reliable Computing (No copies furnished by DTIC/NTIS).

This paper describes an analysis of system detected errors on the MVS operating system under the extended Architecture (XA) for two IBM 3081 systems at the Information Technology Systems (ITS) of Stanford University. The analysis classifies the errors in categories and examines the effectiveness of the recovery system of the MVS/XA. Comparison of the results for the two IBM 3081's confirm the dependence of the error distribution on the type of system utilization, the same system when operating under MVS/SP. The comparison of the MVS/XA to the MVS/SP reveals the following findings: more addressing errors, a better error recording system, and improved reliability and fault tolerance for the MVS/XA than for the MVS/SP. (Author)

535,987
AD-A153 435/3/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Rationale for a Queueable Object Distributed Interprocess Communication System.
Journal article,
R. L. Walton. 11 May 81, 11p JA-5265, ESD-TR-85-048
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Communications, vCOM-30 n6 p1417-1426 Jun 1982.

We consider the problem of designing an interprocess communication system usable as a base for writing real-time operating and applications systems in a distributed environment where processes may be connected by anything from shared virtual memory to radios. By requiring an interface that minimizes the code an application program must devote to communications, a facility of substantially higher level than basic message passing becomes necessary. This is largely a consequence of four major performance problems with interprocess communication in a distributed environment: system reliability, server congestion, throughput, and response time. We summarize these problems, and introduce an interprocess communication system based on two mechanisms: queueable objects and connectable objects. We briefly review our experience with a limited implementation of queueable objects.

535,988
AD-A153 444/5/GAR PC **A02/MF A01**
Texas A and M Univ., College Station. Dept. of Electrical Engineering.
Interim Report for Grant AFOSR-82-0033.
Rept. for 1 Jan-31 Dec 84,
D. Halverson. Jan 85, 12p AFOSR-TR-85-0299
Grant AFOSR-82-0033

A number of results were obtained pertaining to signal detection and data compression for image processing. These results led to improved performance over previous approaches, with special attention given to methods which required less statistical knowledge and which were easier to implement. In particular, robustness and nonparametric techniques were employed to allow the exploitation of whatever knowledge was available, while retaining insensitivity to the remaining inexactness in knowledge. In addition, because the presence of dependency in the underlying random processes often complicates detector design, investigations into when weak dependency could be ignored were undertaken; moreover, results were obtained pertaining to the general subject of the extent of variation (induced by incomplete knowledge of the dependency) in the form of the detector data processor. Finally, some results were obtained which allowed relaxing stationarity assumptions which were placed on the signal in earlier work. (Author)

535,989
AD-A153 451/0 Not available NTIS
Case Western Reserve Univ., Cleveland, OH. Dept. of Computer Engineering.
PLA Microcontroller Using Horizontal Firmware,
C. A. Papachristou. 1984, 9p ARO-18626.10-EL
Contract DAAG29-82-K-0106
Availability: Pub. in Microprocessing and Microprogramming. Euromicro Journal, v13 n3-4 p123-130 1984 (No copies furnished by DTIC/NTIS).

This paper is concerned with a high speed microcontroller suitable for block-structured firmware design. The approach is to express the sequencing structure of a microprogram by sequencing constructs or transactions which invoke context-free blocks of microcode. The underlying hardware structure is based on separate PLAs to store the microsequencing and microcode firmware and a sequencing generating processor. The proposed scheme has significant advantages over earlier designs in terms of execution speed of the horizontally formatted transactions and also simplicity of the processor design. Firmware design by means of this scheme is supported by a variety of tools already developed.

535,990
AD-A153 465/0/GAR PC **A10/MF A01**
Air Force Operational Test and Evaluation Center, Kirland AFB, NM.
Software Operational Test and Evaluation Guidelines. Volume 3. Software Maintainability Evaluator's Guide.
1 Jan 84, 206p Rept no. AFOTEC-PAM-800-2-VOL-3 Supersedes Rept. no. AFTEC-PAM-800-2-VOL-3, dated 15 Apr 82, AD-A140 707.

The purpose of this pamphlet is to provide the software evaluator the information needed to participate in the Air Force Operational Test and Evaluation Center's (AFOTEC's) software maintainability evaluation process. In this pamphlet, 'software maintainability' is limited in scope to software design and documentation assessments. Volume 3 is an evolutionary document that will be updated periodically. Questions contained are intended to be only a representative sample of software maintainability questions. This version incorporates previous user comments, and we solicit your written inputs for the next update. This volume is one in the series of Software Operational Test and Evaluation Guidelines prepared by the Software Evaluation Division of the Logistics Directorate. It is intended for use in the operational test and evaluation of software.

535,991
AD-A153 526/9/GAR PC **A03/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Global Optimization Algorithm Using Stochastic Differential Equations.
Technical summary rept.,
F. Aluffi-Pentini, V. Parisi, and F. Zirilli. Feb 85, 46p
Rept no. MRC/TSR-2791
Contracts DAAG29-80-C-0041, DAJA37-81-C-0740

SIGMA is a set of FORTRAN subprograms for solving the global optimization problem, which implement a method founded on the numerical solution of a Cauchy problem for stochastic differential equations inspired by quantum physics. This paper gives a detailed description of the method as implemented in SIGMA, and reports on the numerical tests which have been performed while the SIGMA package is described in the accompanying algorithm. The main conclusions are that SIGMA performs very well on several hard test problems; unfortunately given the state of the mathematical software for global optimization it has not been possible to make conclusive comparisons with other packages.

535,992
AD-A153 607/7/GAR PC **A23/MF A01**
SRI International, Menlo Park, CA. Network Information Center.
Internet Protocol Transition Workbook.
Mar 82, 528p
Contract DCA200-83-C-0025

This document contains the Internet Protocols, including the Transmission Control Protocol, Internet Protocol, Telnet Protocol, Mail Protocol, and File Transfer Protocols. Numerous other standards and RFCs useful for bringing a host onto the network are provided, as is the NCP/TCP Transition Plan, which is intereating from a historical standpoint. Also included is general information on implementing these protocols, and information on related topics such as assigned numbers. (Author)

535,993
AD-A153 609/3/GAR PC **A21/MF A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
Evaluation and Validation (E&V) Team Public Report. Volume 1.
Interim technical rept. 1 Oct 83-30 Sep 84,
V. L. Castor. 30 Nov 84, 500p Rept no. AFWAL-TR-85-1016-VOL-1

The initial activities and accomplishments of the Evaluation and Validation (E&V) Team are reported. The purpose of the E&V Task, which is sponsored by the Ada Joint Program Office (AJPO), is to develop the techniques and tools which will provide a capability to perform assessment of Ada Programming Support Environments (APSEs) and to determine conformance of APSEs to the Common APSE Interface Set (CAIS). As this technology is developed, it is being made available to DoD components, industry and academia. As with all Ada-related activities, the widest possible participation in the E&V Task is encouraged. (Author)

535,994
AD-A153 617/6/GAR PC **A08/MF A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Computer Science.
Debugging Distributed Computations in a Nested Atomic Action System.
Doctoral thesis,
S. Y. Chiu. Dec 84, 155p Rept no. MIT/LCS/TR-327
Contracts N00014-75-C-0661, N00014-83-K-0125

Concurrent and distributed programs are hard to debug. This thesis argues that structuring activities as nested atomic actions can make debugging such programs much like debugging traditional sequential programs. To support the argument, the author presents a method for debugging computations in the Argus language and system. Her method is applicable to other action systems since it depends only on the atomicity properties of actions. To debug a computation in our method, the user inspects a serial execution that is equivalent to the original computation. The debugging process involves two phases. In the first phase, the user examines pre- and post- states of actions to isolate the action that exposes the bug. In the second phase, the debugging system re-executes code to reproduce the details of the culprit action. The user can repeat this re-execution and can use standard break-and-examine tools on it to isolate the bug. This debugging system supports the method by saving a partial history when an action runs. This history consists mainly of recovery versions of objects. The system also timestamps the termination of actions so it can determine from the saved versions the values of objects in an action's pre- and post- states. The debugging system itself uses pre-states to repeat actions. This thesis presents the first detailed design that uses recovery versions and timestamps for debugging. (Author)

535,995
AD-A153 643/2/GAR PC **A03/MF A01**
Aeronautical Research Labs., Melbourne (Australia).

Program DISAS - A Computer Program to Obtain Hard-Copy Plots of an Image Displayed on a Vector Graphics Device in a Local-Area-Network.
Technical memo..
R. Bateman. Jan 85, 32p Rept no. ARL/SYS-TM-76

Program DISAS is a program which supports the computer graphics facilities of Combat Effectiveness Group at ARL. It operates in a local-area-network incorporating a network of PDP22 minicomputers, a Sanders Graphic-7 vector graphics device and a Versatec electrostatic printer/plotter. Program DISAS produces hard-copy plots on the Versatec printer/plotter of a selected image displayed on the screen of the SANDERS Graphic-7 vector graphics device. A listing of the program can be obtained from the Principal Officer of Combat Effectiveness Group.

535,996

AD-A153 648/1/GAR PC **A08**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Computer Science.
Replication Methods for Abstract Data Types,
Doctoral thesis,
M. P. Herlihy. Jun 84, 158p Rept no. MIT/LCS/TR-319
Contract N00014-75-C-0661

An advantage of distributed systems over centralized systems is that valuable data can be stored redundantly at multiple locations--a practica commonly called 'replication'. Replication can enhance the availability of data in the presence of failures, increasing the likelihood that the data will be accessible when needed. This thesis introduces a new method for managing replicated data. We propose new techniques to address four problems associated with replication: the representation and manipulation of replicated data, concurrency control, on-the-fly reconfiguration, and enhancing availability in the presence of partitions. Unlike many methods that support replication only for uninterpreted files, our method makes use of type-specific properties of objects (such as sets, queues, or directories) to provide more effective replication. Associated with each operation of the data type is a set of quorums, which are collections of sites whose cooperation suffices to execute the operation. Analysis of the algebraic structure of the data type is used to derive a set of constraints on quorum intersections. Any choice of quorums that satisfies these constraints yields a correct implementation, and it can be shown that no smaller set of constraints guarantees correctness. By taking advantage of type-specific properties in a general and systematic way, our method can realize a wider range of availability properties, more concurrency, more flexible reconfiguration, and better tolerance of partitions than existing replication methods.

535,997

AD-A153 649/9/GAR PC **A08**/MF **A01**
Decision Science Consortium, Inc., Falls Church, VA.
Alternative Theories of Inference in Expert Systems for Image Analysis.
Final rept. 15 Jun 84-14 Jan 85,
M. S. Cohen, S. R. Watson, and E. Barrett. Feb 85, 167p DSCI-85-1, ETL-0382
Contract DACA72-84-C-0005

Reasoning with uncertainty is essential in most expert system applications to image understanding, both for bottom-up analysis of pixel data and for top-down utilization of general knowledge. A variety of alternative approaches have been proposed for inference in expert systems: Bayesian probabilities, belief functions, fuzzy sets, non-monotonic logic, and others. They differ in the concepts they seek to address, in their normative justification, in computational feasibility and input burden, and psychological aptness for the purposes of experts and expert system users. The present report has two main objectives: (1) to clarify the strengths and weaknesses of various inference mechanisms for expert system applications, and (2) to develop alternative approaches which remedy shortcomings and retain strengths. We develop the top-level design of a new system, the Non-Monotonic Probabilist (NMP), which takes into account the actual practice of expert statisticians in probabilistic reasoning.

535,998

AD-A153 676/2/GAR PC **A04**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Comparison of Calculations and Measurements of the Off-Axis Radiation Dose (SI) in Liquid Nitrogen as a Function of Radiation Length.
Master's thesis,
P. F. Cromar. Dec 84, 73p

In this thesis results are presented from a study of the off-axis X and Gamma radiation field caused by a highly relativistic electron beam in liquid Nitrogen at various path lengths out to 2 radiation lengths. The off-axis dose in Silicon was calculated using electron/photon transport code CYLTRAN and measured using thermal luminescent dosimeters (TLD's). Calculations were performed on a CDC-7600 computer ar Los Alamos National Laboratory and measurements were made using the Naval Postgraduate School 100 Mev Linac. Comparison of the results is made and CYLTRAN is found to be in agreement with experimentally measured values. The CYLTRAN results are extended to the off-axis dose caused by a 100 Mev electron beam in air at Standard Temperature and Pressure (STP). Additional keywords: Bremsstrahlung; Air dose; Experimental data; Monte Carlo method; Fortran; CYLTRAN computer program; Charts; Tables(data).

535,999

AD-A153 684/6/GAR PC **A03**/MF **A01**
Office of Software Development and Information Technology, Falls Church, VA. Federal Software Testing Center.
Ada Validation Summary Report. ALS AdaVAX Version 1.1 VAX-11/780 using VAX/VMS Release 3.6.
Summary rept.
31 Dec 84, 27p Rept no. OIT/FSTC-84/501

Under U.S. Army Contract DAAK80-C-0507, SofTech, Incorporated has developed an Ada compilation system for the Department of the Army, Headquarters USA, Communications Electronic Command. The compiler, ALS AdaVAX version 1.25, was tested against version 1.4 of the Ada Compiler Validation Capability (ACVC) test site on a VAX-11/780 operating under VAX/VMS version 3.6. Version 1.4 of the test-site contained 2185 tests, of which 1943 were applicable to this implementation. Of the applicable tests, 74 were withdrawn due to errors in the tests. Of the remaining applicable correct tests, all (1875) passed, and no anomaly was discovered.

536,000

AD-A153 692/9/GAR PC **A03**/MF **A01**
Baker (J.T.) Chemical Co., Phillipsburg, NJ.
Development of a Butterfly Multiprocessor Test Bed Description of Butterfly Components.
Quarterly technical rept. no. 1, 16 Oct 83-15 Jan 84,
J. Goodhue, and E. Starr. Mar 85, 32p Rept no. BBN-5872
Contract MDA903-84-C-0033, ARPA Order-4906
Update to Rept. no. BBN 5284 dated Apr 83, AD-A128 373.

In this, the first in a series of quarterly technical reports on the development of a 128-node Butterfly (TM) testbed we present descriptions of the major components of the Butterfly Parallel Processor: the Processor Node (BPN), the MSI Switch Node (BSN), the VLSI Switch Node (BVSN), the Butterfly I/O Board (BI1), the Multibus Adapter (BMA), and the Butterfly Fantail (BFAN). At the end of the report, there is a set of tables that summarize the important characteristics of each component.

536,001

AD-A153 704/2/GAR PC **A07**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Interactive Computer Aid for the Design and Analysis of Linear, Single Input/Single Output Digital and Continuous Control Systems.
Master's thesis,
C. M. Cooksey. Dec 84, 130p

This thesis discusses the development of the Digital and Analog Control System Analysis Program (DACSAP). DACSAP is an interactive computer aid for the design and analysis of linear, single input/single output feedback control systems. DACSAP is user friendly; it uses menus for option selection and prompted data entry. The program will analyze systems which are described by transfer functions written in the s, z, w or w' domains. The program will manipulate the transfer functions of multi-loop systems to produce the open and closed loop systems to produce the open and closed loop transfer functions required for a variety of analysis techniques. The analysis techniques included in DACSAP are root locus, open and closed loop Bode frequency response, Nyquist frequency response, Nicols frequency response and closed loop time response. The output of any of these analysis techniques may be either a tabulation of data points or a high resolution plot.

536,002

AD-A153 746/3/GAR PC **A03**/MF **A01**
Office of Software Development and Information Technology, Falls Church, VA. Federal Software Testing Center.
Ada (Trademark) Compiler Validation Summary Report. Honeywell Information Systems GCOS6 Ada Version 1.1.
Final rept.
14 Dec 84, 29p Rept no. OIT/FSTC-84/515

The Honeywell Information Systems Compiler GCOS6 Ada version 1.1, for the DPS 6/95, DPS 6/75, DPS 6/45, microSystem 6/20 and microSystem 6/10 using GCOS6 MOD400, was tested with version 1.4 of the ACVC validation tests. Version 1.4 of the test site contained 2185 tests, of which 2008 were applicable to this implementation. Of the applicable tests, 71 were withdrawn due to errors in the tests. Of the remaining applicable correct tests 1937 passed, and no anomaly was discovered.

536,003

AD-A153 750/5/GAR PC **A02**/MF **A01**
Bureau d'Orientation de la Normalisation en Informatique, Rocquencourt (France).
Ada (Trademark) Compiler Validation Summary Report: ALSYS ALSYCOMP-0001.
Final rept.
8 Dec 84, 25p

The purpose of this report is to document the results of the testing performed on the compiler, and in particular, to identify any language constructs supported by the compiler that do not conform to the Ada standard; identify any unsupported language constructs required by the Ada standard; describe implementation-dependent behavior allowed by the standard.

536,004

AD-A153 760/4/GAR PC **A02**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
Distributed Database Design Tool.
Final rept. May-Dec 84,
T. Bentson. Mar 85, 14p Rept no. NOSC/TD-783

This document discusses a simulation design tool for distributed database management systems. The ability to model database transaction processing has been added to an existing communications software testbed. The information architecture used is an extension of the ANSI/SPARC standard three-schema DBMS architecture. This extended architecture was developed by the Honeywell Computer Science Center. This document discusses the standard DBMS architecture, the extended distributed DBMS architecture, the logical transaction model of database operations, and the method of simulating this logical model. Measures of data management effectiveness are also discussed. These algorithms, called 'global schemas' and 'local schemas', are unique to distributed DBMSs. These govern the location, correlation, storage, retrieval, and deletion of multiple data copies. A distributed DBMS relies on the service of a communications system to transmit both control information (e.g., 'read' or 'write') and data. The test and evaluation methodology allows the distributed DBMS to be modeled and tested together with the underlying communications system in order to allow these systems to be tuned to each other.

536,005

AD-A153 766/1/GAR PC **A02**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Use of VLSI (Very Large Scale Integration) Technology for the Real-Time Generation of Graphics Displays: A Proposal,
M. J. Zyda. Mar 85, 14p Rept no. NPS52-85-003

This study proposes to look at special purpose VLSI architectures for realtime display generation. The goal is the development of a methodology for taking a selected computer graphics algorithm and producing a silicon system that performs that algorithm. Several graphics algorithms that have the potential for VLSI implementation will be identified and studied. Part of this effort will be a characterization of the changes in the

architecture of the graphics display system made necessary by the addition of such real-time display generation.

536,006

AD-A153 774/5/GAR PC **A04**/MF **A01**
BBN Communications Corp., Cambridge, MA.
ARPANET 1822L Host Access Protocol RFC (Request for Comments) 878,
A. G. Malis. Dec 83, 52p
Contract DCA100-82-C-0076

This RFC specifies the ARPANET 1822L Host Access Protocol, which is a successor to the existing 1822 Host Access Protocol. The 1822L procedure allows ARPANET hosts to use logical identifiers as well as 1822 physical interface identifiers to address each other.

536,007

AD-A153 869/3/GAR PC **A03**/MF **A01**
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
0.487 Throughput Limited Sensing Algorithm.
Technical rept.,
L. Georgiadis, and P. Papantoni-Kazakos. Mar 85, 38p UCT/DEECS/TR-85-3, AFOSR-TR-85-0397
Grant AFOSR-83-0229

The authors consider Poisson packet traffic, accessing a single slotted channel. They assume the existence of ternary feedback, per channel slot. They also adopt the limited feedback sensing model, where each packet senses the feedback only while it is blocked. For the above model, they develop a collision resolution protocol, with last-come first serve characteristics, and they name the protocol, LSTFA. The LSTFA is a refinement of the algorithm developed in another document and it attains the same throughput as Gallager's algorithm does, without the full feedback sensing requirement in the latter. The algorithm is also easy to implement, it requires reasonable memory storage, it induces uniformly good transmission delays, and it is robust in the presence of feedback errors. In the presence of binary (collision versus noncollision) feedback, the algorithm may attain throughput 0.4493; the highest known to this point, among both full and limited sensing algorithms. (Author)

536,008

AD-A153 871/9/GAR PC **A05**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD. Computation, Mathematics and Logistics Dept.
ZOG/Vinson Technology Demonstration Project: System Description. Volume 2.
Final rept. Mar 81-Oct 84,
D. J. Schmelter, and R. Lupish. Feb 85, 96p Rept no. DTNSRDC/CMLD-85/02

The ZOG system is a user-modifiable, menu-oriented, rapid response human-computer interface on a network of powerful workstations, the PERQ Systems Corporation's PERQ microcomputers. This document describes how the ZOG system operates. This is not a user's guide but a description of what is behind all of the menu creation and other standard features. This document is divided into four separate and distinct volumes. It was written this way to best describe the total system while keeping volumes apart so as to make each one accessible without having to go through the others. The first volume is the ZOG System Description. The system description includes a description of: An overview of the ZOG system, the initialization process, basic system flow, how accessing frames and subnets is accomplished, ZOG utilities, ZOG editors and ZOG and ZOG agents. The second volume is ZOG structures. This volume lists all of the different structures used within the code that makes up ZOG. The third volume is ZOG Files. ZOG Files lists and describes all of the files that ZOG needs in order to run. These files are in addition to all the source and executable files that make up the ZOG system. The fourth volume is ZOG Modules. ZOG Modules goes through ZOG, module by module, describing what is going on.

536,009

AD-A153 952/7/GAR PC **A02**/MF **A01**
University of Southern California, Marina del Rey. Information Sciences Inst.
Transportability in the Consul System: Model Modularity and Acquisition.
Research rept.,
D. Wilczynski, and N. Sondheimer. Apr 85, 20p Rept no. ISI/RR-85-154
Contract MDA903-81-C-0335

Transportability in the Consul system means integrating new computer services within the existing framework. That integration covers a lot of ground in the Consul view of things. When a new service is built, we want to know enough about its functionality and objectives so it can share the user interface, the natural language system, and the interaction environment (error handling, data coercion, history, etc.). We do this by building a single knowledge base that models the relevant parts of the workstation environmment (and any existing services). When a new service is brought in, it is modeled and tied to the existing knowledge base through an acquisition process that guarantees the integration we demand. By acquiring a service, we have 'transported' our system to it. This paper will describe how we currently organize knowledge bases to facilitate the acquisition process and how this methodology can be extended to the natural language part of the system.

536,010

AD-A153 986/5/GAR PC **A03**/MF **A01**
Texas Univ. at Austin. Center for Cybernetic Studies.
Primal Simplex Approach to Pure Processing Networks.
Research rept.,
C. H. Chen, and M. Engquist. Feb 85, 39p Rept no. CCS-496
Contracts N00014-81-C-0236, N00014-82-K-0295
Sponsored in part by Contract MDA903-83-K-0312.

Pure processing network problems are minimum cost flow problems in which the flow entering or leaving a node may be constrained to do so in given proportions. In this paper, new theoretical results concerning pure processing networks are developed, and based on these results, two new primal simplex variants are presented. One of these variants has been implemented and tested against a general purpose linear programming code. A large class of problems is identified for which specialized code is an order of magnitude faster than the general purpose code.

536,011

AD-A153 988/1/GAR PC **A06**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Specification of Software Quality Attributes. Volume 1. Final Report.
Final rept. Aug 82-Oct 84,
T. P. Bowen, G. B. Wigle, and J. T. Tsai. Feb 85, 111p D182-11678-1, RADC-TR-85-37-VOL-1
Contract F30602-82-C-0137
See also Volume 2, AD-A153 989.

This document is the first of three volumes of the Final Technical Report for the Specification of Software Quality Attributes contract. The purpose of this contract was to (1) consolidate results of previous RADC contracts dealing with software quality measurement, (2) enhance the software quality framework, and (3) develop a methodology to enable a software acquisition manager to determine and specify software quality factor requirements. The methodology and framework elements were developed to focus on an Air Force software acquisition manager specifying quality requirements for embedded software that is part of a command and control application. This methodology and most of the framework elements are generally useful for other applications and different environments. Volume I describes the results of research efforts conducted under this contract, including recommendations for integrating quality metrics technology into the Air Force software acquisition management process, recommended changes to Air Force software and acquisition documentation, and summaries of software quality framework changes and specification methodology features.

536,012

AD-A153 989/9/GAR PC **A07**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Specification of Software Quality Attributes. Volume 2. Software Quality Specification Guidebook.
Final rept. Aug 82-Oct 84,
T. P. Bowen, G. B. Wigle, and J. T. Tsai. Feb 85, 147p D182-11678-2, RADC-TR-85-37-VOL-2
Contract F30602-82-C-0137
See also Volume 2, AD-A153 990.

The document is the first of three volumes of the Final Technical Report for the Specification of Software Quality Attributes contract. The purpose of this contract was to (1) consolidate results of previous RADC contracts dealing with software quality measurement, (2) enhance the software quality framework, and (3) develop a methodology to enable a software acquisition manager to determine and specify software quality factors requirements. The methodology and framework elements were developed to focus on an Air Force software acquisition manager specifying quality requirements for embedded software that is part of a command and control application. Volume II and III describe the methodology for using quality metrics technology and include an overview of the software acquisition process using this technology and the quality frame work. Volume II describes methods for specifying software quality requirements and addresses the needs of the software acquisition manager. Volume II also describes and techniques for specifying software quality requirements in terms of quality factors and criteria. Factors interrelationships, relative costs to develop high quality levels, and an example for a command and control application are also described. Procedures for assessing compliance with specified requirements are included.

536,013

AD-A153 990/7/GAR PC **A14**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Specification of Software Quality Attributes. Volume 3. Software Quality Evaluation Guidebook.
Final rept. Aug 82-Oct 84,
T. P. Bowen, G. B. Wigle, and J. T. Tsai. Feb 85, 302p D182-11678-3, RADC-TR-85-37-VOL-2
Contract F30602-82-C-0137
See also Volume 1, AD-A153 988.

The document is the first of three volumes of the Final Technical Report for the Specification of Software Quality Attributes contract. The purpose of this contract was to (1) consolidate results of previous RADC contracts dealing with software quality measurement, (2) enhance the software quality framework, and (3) develop a methodology to enable a software acquisition manager to determine and specify software quality factors requirements. The methodology and framework elements were developed to focus on an Air Force software acquisition manager specifying quality requirements for embedded software that is part of a command and control application. This methodology and most of the framework elements are generally useful for other applications and different environments. Volumes II and II describe the methodology for using the metrics technology and include an overview of the software acquisition process using this technology and quality framework. Volume III describes methods for evaluating achieved quality levels of software products and addresses the needs of data collection and analysis personnel. Volume III also describes procedures and techniques for evaluating achieved quality levels of software products. Worksheets for collecting metric data by software lifecycle phase and score sheets for scoring each factor are provided in the appendixes. Detailed metric questions are nearly identical to questions in the Software Evaluation Reports proposed as part of the Software Technology for Adaptable Reliable Systems (STARS) Measurement data item descriptions.

536,014

DE85007899/GAR PC **A02**/MF **A01**
Argonne National Lab., IL.
Tradeoffs among Portability, Complexity, and Efficiency in Multiprocessing Environments.
E. L. Lusk, and R. A. Overbeek. 1985, 17p CONF-8503117-1
Contract W-31-109-ENG-38
Workshop on parallel processing using the heterogeneous element processor, Norman, OK, USA, 20 Mar 1985.
Portions of this document are illegible in microfiche products.

In this paper we investigate the question of reconciling portability issues with the desire to capitalize on massive parallelism. We center our attention on a fairly straightforward (but prototypical) grid computation. We describe three portable implementations suitable for use on multiprocessors: one was designed for a machine with a limited number of processors and a globally shared memory, one will function well on a machine with a large number of processors and a globally shared memory, and the last will port between a fairly

wide variety of machines (including the Denelcor HEP, the CRAY-XMP, and hypercubes). Our experiences would indicate that, for those grid computations that can capitalize on massive parallelism, it is possible to write code that will port straightforwardly between machines that do support a globally shared memory and those that do not. However, such portability does introduce some complexity into the actual formulation and implementation of an appropriate algorithm. (ERA citation 10:023365)

536,015

DE85006880/GAR PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Micro-CAE Mechanical Engineering Software Development.
W. Comfort, and B. Davis. 8 Feb 85, 6p UCID-20364
Contract W-7405-ENG-48
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

A concept in Microcomputer-Aided Engineering has been evolving and maturing at Lawrence Livermore National Laboratory during the past 4 years. In harmony with the goals of the project, several universities are participating in the development of software which will be useful both to engineering colleges and to practicing engineers. Among the universities who have had faculty participants in this project are University of California (Berkeley), University of Arkansas, Oregon State University, University of California (Santa Barbara), and Northern Arizona University. The goals of the project are that of developing, collecting, and/or converting approximately 40 software packages, and transfering Micro-CAE technology/software to universities. Micro-CAE is defined as the use of special purpose microcomputer graphics-augmented software, invoked for the purpose of aiding engineers in modeling physical events and designing systems. The software is further characterized by user-system interactiveness, high degree of system friendliness, and heavy dependence on automatic graphics interpretation. The software will be made available to any university for instructional purposes at a cost of no more than what it costs to reproduce the diskettes and documentation. Approximately one-third of the software is now available, including: REFRIF - A vapor-compression refrigeration modeling program, SPRING - A spring design program, RANKINE - A steam power cycle modeling program, VIBMAIN - A one-degree of freedom vibration modeling program, SHAFT - A stepped-shaft design/modeling program, BEARING - An oil-cooled bearing design program, DELAWARE - A tube-in-shell heat exchanger program, DOUPIPE - A double-pipe heat exchanger program, MECHAN - A kinetic/kinematic mechanisms program, INOUT - Interactive input/output routines, KERNEL80 - Graphics primitive, and TRIX - A line editor and word processor. The software will be made available to run under CP/M and MS-DOS operating systems. (ERA citation 10:022968)

536,016

DE85009447/GAR PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Parallel Computation of Multiple-Scale Problems. Revision 1.
R. C. Y. Chin, G. W. Hedstrom, J. R. McGraw, and F. A. Howes. 1 Mar 85, 17p UCRL-92007-Rev.1, CONF-8411140-3-Rev.1
Contract W-7405-ENG-48
ARO workshop on new computing environments: parallel, vector and systolic, Stanford, CA, USA, 7 Nov 1984.

The efficient use of multiprocessor computers requires the introduction of new numerical algorithms, and the identification by asymptotic analysis of concurrencies inherent in the governing equations of multiple-scale problems is a good way to develop such algorithms. The language used must be able to maintain these concurrencies. Finally, depending on the problem and the computer, this concurrency may not be sufficient to keep all the processors busy, so that the language must be able to identify additional concurrencies. These ideas are illustrated in an example based on a convection-diffusion equation. (ERA citation 10:023372)

536,017

PB85-185668/GAR PC **E03**/MF **E03**
Radcliffe Science Library (England).
Satisfying Users' Requirements in Computer System Design - An Approach Based on Environmental Psychology,
A. P. Jagodzinski. Jun 84, 13p RSL/ENG-673/6

This report is concerned with the problem of achieving a better match between the needs of staff using a computer system and the design of the system. It reviews and evaluates existing techniques in the field of computer system design and looks at methods which are being used to solve similar problems in other fields, such as architecture and town planning. Finally it outlines a proposal for applying techniques which have been proved in other disciplines to the design of computer systems.

536,018

PB85-191302/GAR PC **A05**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Periodicals for Microcomputers: An Annotated Bibliography.
Working paper,
T. C. Stilwell. 1983, 76p MSU/INTERNATIONAL DEVELOPMENT PAPER/WP-6, AID-PN-AAN-443

Because microcomputer technology is evolving so rapidly that books on the subject are outdated almost immediately, the best sources of information on new and existing hardware and software are in periodicals such as magazines, journals, and newspapers. This directory is intended to help increase awareness in developing countries of relevant periodicals that are available on the world market. An alphabetical listing by title is presented, with the address for subscription information, subscription rates, the computer specialty, and usually a brief annotation.

536,019

PB85-194025/GAR PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Sulla Applicazione delle Metodologie di Transformazione Lineare e Non-Lineare a Problemi di Classificazione di Dati Telerilevati (The Use of Linear and Non-Linear Mapping Methods to Resolve Problems in the Classification of Remote-Sensing Data),
F. Beonio-Brocchieri. c1984, 41p EUR-9131-IT
Text in Italian.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The paper reviews recent developments in the use of linear mapping of original remotely sensed data into more effective features, from the point of view of class separability. Different theoretical investigations have been described and compared. This paper also illustrates the importance, in multi-hypothesis Pattern Recognition problems, of the connection between a non-linear mapping into the space defined by the a-posteriori probability distributions (corresponding to the classes under investigation) and the Bayesian Probability of misclassification.

536,020

PB85-209443/GAR PC **E05**/MF **E01**
Mitsubishi Electric Corp., Tokyo (Japan).
Mitsubishi Denki Giho, Vol. 59, No. 2, 1985.
c1985, 78p
Text in Japanese with English abstracts. See also PB85-209450 through PB85-209484, and PB85-136117.

This issue on Computer Aided Engineering has articles on: Interactive Electronic-Circuit Simulation Using a CAE Workstation; The Hardware of the MELCOM 70 MX/3000 Super Minicomputer; The Basic software of the MELCOM 70 MX/3000 Super Minicomputer; CAE Software and its applications; A CAE System with a LAN for R&D; CAE Design Drawings for Sewage-Treatment Plants; A Bottle-Finish inspection system; A rod-drop detection System; DUET: A MELCOM 80 end-user language; A High-performance image-processing System; The Development of a computational aerodynamics program (SUSCAP) for missile design using the boundary element method and the Application of an AC Digital-Drive System in a Hot Rolling Mill.

536,021

PB85-209450/GAR
(Order as PB85-209443/GAR, PC **E05**/MF **E01**)
Mitsubishi Electric Corp., Tokyo (Japan).
CAE (Computer-Aided Engineering) System with a LAN (Local-Area Network) for R and D,
Y. Takahashi, H. Kaneko, M. Yasuda, K. Tsuchiyama, and T. Koizumi. c1985, 5p
Text in Japanese.
Included in Mitsubishi Denki Giho, v59 n2 p1-5 1985.

Computer-aided engineering (CAE) shows its greatest promise as a research and development tool. A broadly based CAE system allows such R&D operations as repeated trial-and-error experiments in which information from avariety of fields is gathered, processed, and analyzed and the results evaluated to be performed by fewer people in less time and at lower cost than previously possible. The article describes a CAE network installed at the Mitsubishi Electric Itami Works. The system employs a local-area network(LAN) to link large-scale, medium-scale, and personal computer systems in a hierarchical configuration. The system permits diagram generation, numerical analysis, material analysis, and experimental testing.

536,022

PB85-861730/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Parallel Processors. 1979-June 1985 (Citations from the NTIS Data Base).
Rept. for 1979-Jun 85.
Jun 85, 261p
Supersedes PB83-808113.

This bibliography contains citations concerning the design, development, and applications of parallel processors. Topics include image and signal processing, machine circuit analyses, algorithm and architecture descriptions, and scheduling strategies. Synchronous and asynchronous systems, and descriptions of specific machines used in problem-solving systems are considered. Some attention is given to applications in artificial intelligence. (This updated bibliography contains 306 citations, 106 of which are new entries to the previous edition.)

536,023

PB85-862043/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Optical Character Recognition. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 114p
Supersedes PB83-808170.

This bibliography contains citations concerning technology reviews, developments, and applications of optical character recognition techniques and equipment. Topics include specific systems descriptions and evaluations, theoretical aspects, and appropriate industry standards. Applications include postal system studies, data entry, and cartography. Algorithm design aspects are briefly considered. (This updated bibliography contains 130 citations, 13 of which are new entries to the previous edition.)

536,024

PB85-862183/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
MIMD Machines. 1976-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1976-Jun 85.
Jun 85, 80p
Supersedes PB84-870575.

This bibliography contains citations concerning the design, development, and applications of MIMD (multiple instruction, mutiple data) machines for image processing and pattern recognition. Design aspects, parallel processing, and language considerations are among the topics discussed. MIMD interconnection network design, implementation, and analysis are included. Some attention is given to specific systems descriptions. (This updated bibliography contains 90 citations, 10 of which are new entries to the previous edition.)

536,025

PB85-862258/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.

Fault Tolerant Computers and Multiprocessing. 1975-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-Jun 85.
Jun 85, 93p
Supersedes PB84-869197.

This bibliography contains citations concerning computational concurrency and fault tolerant features of computer hardware, including their design, architecture and applications. Greedy's diagnostic theory, multiple node and link failures, transient fault detection, error correction, and fault recovery are among the topics discussed. Reliability studies on various systems by real time testing and statistical analysis are presented. (This updated bibliography contains 108 citations, 22 of which are new entries to the previous edition.)

9C. Electrical and Electronic Engineering

536,026
AD-A153 685/3/GAR PC **A05/MF A01**
Kling-Lindquist, Inc., Philadelphia, PA.
Direct Digital Control Study.
Feb 85, 81p HNDSP-85-105-ED-ME
Contract DACA87-82-D-0036

The purpose of this report is to describe the state-of-the-art of direct digital control (DDC) system technology that monitors and controls mechanical and electrical systems found in Government facilities. A DDC system can operate either as a stand-alone control system or as an extension to an Energy Monitoring and Control System (EMCS). Direct digital control systems are self-contained computer based systems which monitor and control processes in accordance with predetermined strategies. This report addresses the commercial-type DDC systems, in which sensors and controls are connected to a control panel. Control devices are modulated directly by the DDC system in accordance with established algorithms. Unlike industrial-type DDC systems, commercial-type DDC systems do not have a specific address for each control point position.

536,027
DE85009498/GAR PC **A03/MF A01**
Lawrence Livermore National Lab., CA.
Engineering Technology Base Thrust Areas.
H. C. McDonald. 1985, 46p UCID-20366-85
Contract W-7405-ENG-48

Efforts in the following areas are briefly summarized: diagnostics and microelectronics engineering, signals and control engineering, microwave and pulsed power engineering, computer-aided engineering in both electronics and mechanical engineering, engineering modeling and simulation, systems engineering, fabrication technology, non-destructive evaluation, and dynamic systems and controls. (ERA citation 10:022961)

536,028
DE85009777/GAR PC **A03/MF A01**
Lawrence Livermore National Lab., CA.
Electrical Line Source and Point Source Interactions with Anomalies in the Ground.
R. J. Lytle, and J. A. Beatty. Dec 84, 30p UCID-20372
Contract W-7405-ENG-48
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

Illustrative examples show that line source electrode interactions with a cylindrical anomaly can serve as an adequate qualitative model for point source electrode interactions with cylindrical and spherical anomalies. Subject to certain restrictions, the quantitative results for point and line source interactions with cylindrical anomalies can even be approximately the same. This is of benefit, due to the simplicity of the line source mathematical representation, in being able to determine the utility of means for sensing various anomalies within the ground. (ERA citation 10:023002)

536,029
DE85780526/GAR PC **A03/MF A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Instrumentation and Applied Physics Div.
Low Level Radiation Testing of Micro-Electronic Components. Pt. 1. Review of Current Technology and Proposed Experimental Programme.
J. Farren, J. H. Stephen, D. Mapper, T. K. Sanderson, and M. Hardman. May 84, 43p AERE-R-11025
Work done for the European Space Agency.
U.S. Sales Only.

A review of the existing literature has been carried out, dealing with the current technology relating to low level radiation testing of microelectronic devices, as used in space satellite systems. After consideration of the space radiation environment, the general effects of cosmic radiation on MOSFET structures and other MOS devices have been assessed. The important aspect of annealing phenomena in relation to gamma-ray induced damage has also been reviewed in detail. The experimental and theoretical aspects of radiation testing have been assessed, with particular reference to the Harwell LORAD low level irradiation test facility. In addition, a review of modern dosimetry methods has been carried out, with specific regard to the problems of accurately measuring low radiation fields (1 to 10 R/hour) over periods of many months. Finally, a detailed account of the proposed experimental programme to be carried out in the LORAD facility is presented, and aspects of the experimental set-up discussed. The particular types of test circuits to be studied are dealt with, and full consideration is given to the various CMOS memory devices of special interest in the ESA space satellite programme. (Atomindex citation 15:062170)

536,030
DE85780635/GAR PC **A04/MF A01**
Risoe National Lab., Roskilde (Denmark).
Electronics Department (Risoe National Laboratory, Denmark) Progress Report 1983.
May 84, 54p RISO-M-2434
U.S. Sales Only.

this report summarizes the Electronics Department's activities in 1983. These include work under the headings of man-machine system and operator studies, reliability techniques, application of nuclear techniques to mineral exploration, applied laser physics, computing and, lastly, research instrumentation. (Atomindex citation 15:070609)

536,031
NUREG/CR-4180/GAR PC **A06/MF A01**
Argonne National Lab., IL.
State-of-the-Art of Solid-State Motor Controllers.
Final rept. 1983-84,
R. A. Jaross, T. P. Mulcahey, and E. R. Koehl. Apr 85, 122p ANL-84-102

The state-of-the-art of solid-state motor controllers (SSMCs) is assessed in terms of use, probability of Class 1E qualification, failure rate experience, and reliability prediction. Surveys of commercial availability, nuclear and nonnuclear electric utility experience, and architect-engineering use were made relative to the suitability of SSMCs for nuclear service. Reasons for the limited use of SSMCs in nuclear plants are given. Available failure rate data are meager, and are augmented by data on other solid-state power electronic devices that are shown to have subcomponents similar to those found in SSMCs. In addition to large nonnuclear solid-state adjustable-speed motor drives, the reliability of nuclear plant inverter systems and high-voltage solid-state DC transmission line converters is assessed. Class 1E environmental qualification experience with nuclear plant converter/inverters and battery chargers is shown to be directly applicable to SSMCs. No problems are expected in qualifying them. Actual reliability predictions of two typical commercial SSMCs are given, together with predictions of improvements possible with use of high-quality parts and manufacturing procedures.

536,032
PB85-191393/GAR PC **A02/MF A01**
National Bureau of Standards (NEL), Gaithersburg, MD. Center for Electronics and Electrical Engineering.
Center for Electronics and Electrical Engineering Technical Progress Bulletin Covering Center Programs, July - September 1984 with 1985 CEEE Events Calendar,
J. F. Mayo-Wells. Dec 84, 25p NBSIR-84/2877-3
See also PB84-222785.

This is the eighth issue of a quarterly abstract journal covering the work of the National Bureau of Standards Center for Electronics and Electrical Engineering. This issue of the Center for Electronics and Electrical Engineering Technical Progress Bulletin covers the third quarter of calendar year 1984. Abstracts are provided by technical area for both published papers and papers approved by NBS for publication.

536,033
PB85-209476/GAR
(Order as PB85-209443/GAR, PC **E05/MF E01**)
Mitsubishi Electric Corp., Tokyo (Japan).
Computer-Aided Engineering System for Electromagnetic-Field Analysis,
S. Sakabe, S. Osugi, H. Oishi, T. Tsukamoto, and T. Okabe. c1985, 5p
Text in Japanese.
Included in Mitsubishi Denki Giho, v59 n2 p14-18 1985.

A computer-aided engineering (CAE) system has been developed for analyzing electromagnetic fields. The system features an integrated pre- and post processing program in addition to conventional functions, allowing it to rapidly calculate design parameters for a wide range of electric and electronic equipment. The report describes the structure of the CAE system and introduces practical examples of its use. Remaining problems and future CAE-system development themes are also examined.

9D. Information Theory

536,034
AD-A153 434/6/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Implementation of 2-D Digital Filters by Iterative Methods.
Journal article,
T. F. Quatieri, and D. E. Dudgeon. Jun 82, 15p JA-5268, ESD-TR-85-049
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-30 n3 p473-487 Jun 1982.

A two-dimensional (2-D) rational filter can be implemented by an iterative computation involving only finite-element impulse response (FIR) filtering operations, provided a certain convergence criterion is met. In this paper, we generalize this procedure so that the convergence criterion is satisfied for any stable 2-D rational transfer function. One formulation which guarantees convergence invokes a relaxed form of the iterative computation along with prefiltering the numerator and denominator polynomials of the rational transfer function. This implementation may be applied with a frequency varying relaxation parameter for increasing the rate of convergence. An alternative generalization uses several previously computed iterates, unlike our first modification which utilizes only the most recently computed iterate. This formulation can potentially guarantee convergence and also increase the convergence rate without the requirement of prefiltering.

536,035
AD-A153 458/5/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Reconstruction of a Multidimensional Sequence from the Phase or Magnitude of Its Fourier Transform.
Journal article,
M. H. Hayes. Apr 82, 16p JA-5217, ESD-TR-85-043
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-30 n2 p140-154 Apr 82.

This paper addresses two fundamental issues involved in the reconstruction of a multidimensional sequence from either the phase or magnitude of its Fourier transform. The first issue relates to the uniqueness of a multidimensional sequence in terms of its phase or magnitude. Although phase or magnitude information alone is not sufficient, in general, to uniquely specify a sequence, a large class of sequences are shown to be recoverable from their phase or magnitude. For those sequences which are uniquely specified by their phase, several practical algorithms are described which may be used to reconstruct a sequence

from its phase. Several examples of phase-only reconstruction are also presented. Unfortunately, however, even for those sequences which are uniquely defined by their magnitude, it appears that a practical algorithm is yet to be developed for reconstructing a sequence from only its magnitude. Nevertheless, an iterative procedure which has bee proposed is briefly discussed and evaluated.

536,036

AD-A153 495/7 Not available NTIS
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
Unified Approach to Serial Search Spread-Spectrum Code Acquisition. Part 1. General Theory,
A. Polydoros, and C. L. Weber. May 84, 9p ARO-19147.33-EL-PT-1
Contracts DAAG29-82-K-0142, N00014-82-K-0328
See also Part 2, AD-A153 239.
Availability: Pub. in IEEE Transactions on Communications, vCOM-32 n5 p542-549 May 84 (No copies furnished by DTIC/NTIS).

The purpose of this two-part paper is threefold: (1) Part I discusses the code-acquisition problem in some depth and (2) also provides a general extension to the approach of analyzing serial-search acquisition techniques via transform-domain flow graphs; (3) Part II illustrates the applicability of the proposed theoretical framework by evaluating a matched-filter (fast-decision rate) noncoherent acquisition receiver as an example. The theory is formulated in a general manner which allows for significant freedom in the receiver modeling. The statistics of the acquisition time for the single-dwell and N-dwell systems are shown to be special cases of this unified approach.

9E. Subsystems

536,037

AD-A153 437/9/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Comparison of Single- and Dual-Gate FET Frequency Doublers.
Journal article,
A. Gopinath, A. J. Seeds, and J. B. Rankin. Jun 82, 3p JA-5248, ESD-TR-85-046
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-30 n6 p919-920, Jun 1982.

The performance of the single- and dual-gate FET frequency doublers is studied by analysis and computer simulation. The theoretical predictions are in good agreement with experimental results. It is shown that the superior performance of the dual-gate FET doubler is largely due to the higher intrinsic gain of the active device.

536,038

AD-A153 461/9/GAR PC **A04**/MF **A01**
Naval Weapons Center, China Lake, CA.
Simulation Study of Jammer Nulling Trade-Offs in a Reactively Steered Adaptive Array.
Interim rept.,
R. J. Dinger. Feb 85, 62p NWC-TP-6611, SBI-AD-E900 450

Antenna arrays that operate at frequencies up to 6 GHz or so on air-launched guided missiles are necessarily compact because of limited space. Research has been in progress since FY82 on a compact adaptive array that uses reactively loaded parasitic elements for pattern control. This report describes a study of this class of array whose purpose is to examine the tradeoffs available among number of elements, element spacing, and number of nuliable jammers. The research is part of a continuing effort to explore novel radio frequency radiating and receiving structures for application to airborne communications and radar system.

536,039

AD-A153 468/4/GAR PC **A02**/MF **A01**
Stanford Univ., CA. Stanford Electronics Labs.
System Design of Multi-Layer (Three Dimensional) Integrated Circuits.
Final rept.,
J. F. Gibbons. Apr 85, 17p
Contract N00014-83-K-0363

Research carried out on beam processing of semiconductors led to the concept of a three dimensional integrated circuit. It was shown that MOS devices could be made on both sides of a laser-recrystallized thin film of silicon, deposited on an insulating substrate (SOI) and also on vertically arranged, recrystallized silicon films separated by insulating layers of silicon dioxide and/or silicon nitride/oxide combinations. It follows from these observations that integrated circuits can be made by vertically interconnecting devices made on separate layers. Such circuits could lead to improved packing density, which would be important for memory applications; and possibly to increased circuit speed, which would be important for logic application.

536,040

AD-A153 562/4/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Single-Gate MESFET Frequency Doublers.
Journal article.
A. Gopinath, and J. B. Rankin. Jun 82, 8p ESD-TR-85-054
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-30 n6 p869-875 Jun 82.

A simple analytical model of the FET frequency doubler is used to determine the relative contributions of the various nonlinearities to harmonc generation. FET doubler conversion gain and its variation with frequency available gain is also estimated. Large-signal computer simulations are used to determine the validity of the analytical model and provide further information on conversion gain and its frequency dependence. The analytical and computer predictions are compared with experimental measurements on a 4- to 8-GHz single-gate FET frequency doubler.

536,041

AD-A153 569/9/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Process Considerations in Restructurable VLSI (Very Large Scale Integration) for Wafer-Scale Integration.
Journal article,
P. W. Wyatt, J. I. Raffel, G. H. Chapman, B. Mathur, and J. A. Burns. 1984, 5p MS-6648A, ARO-TR-85-176
Contract F19628-80-C-0002
Pub. in Proceedings of the IEEE International Electron Devices Meeting, p626-629, 9-12 Dec 84.

Wafer-scale integration has recently been demonstrated using a technique called Restructable VLSI. An array of logic cells embedded in programmable interconnect is fabricated in the wafer. All the parts are tested by wafer probing, and links are made or broken with a laser to wire the complete system. One such chip, a digital integrator 24 sq cm in area with 25 MHz input data rate, has been successfully programmed. This paper will describe the RVLSI concept and discuss several aspects of wafer fabrication which are unusual in this technology.

536,042

AD-A153 575/6/GAR PC **A02**/MF **A01**
Huntsville Microcircuits, Inc., AL.
Microcircuit Package Sealing and Leak Testing.
Final technical rept.,
W. R. Clayton. 29 Apr 81, 20p
Contract DAAH01-80-C-0349

The U.S. Army Missile Command, DRSMI-ET, Redstone Arsenal, Alabama, (herinafter referred to as MICOM) produced a high-throughput unified system for sealing and leak-testing microcircuit metallic packages. This system was custom-designed and built under the technical direction of MICOM by the collaboration of a number of contractor companies, as an MM&T task. The ultimate objective of the task was to advance the capability of the DoD/Industry team in the ares of high-volume production of high-reliability cost-effective hermatically-sealed metallic-packaged hybrid microcircuit modules, by the development and demonstration of this unified sealing and leak-testing system. Contract No. DAAHO1-80-C-0349 was awarded by MICOM to Huntsville Microcircuits, Inc. (hereinafter referred to as HMI) with the objective that HMI procure sample metallic packages for use in the development and demonstration of the MICOM sealing/leak-testing system, and provide engineering labor support for the evaluation, demonstration, and documentation of that system. The specific requirements delineated in the Scope of Work, page 10 of the subject Contract, defined the framework for this effort.

536,043

AD-A153 699/4/GAR PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Three-Dimensional Data Display on the Two-Dimensional Screen.
Master's thesis,
H. S. Hwang. Dec 84, 84p

The difficulties encountered when implementating orthographic reprojection of 3-dimensional image data onto a 2-dimensional screen arise principally because of the size of data being manipulated and the tendency for underlying or overlying structures to obscure a clear view of the desired image. In this thesis, implementation was performed with an orthographic reprojection technique and many heuristic approaches were used to resolve some of the related problems. Of the several coordinate rotating algorithms tested, the Precalculation and Indexing algorithm proved to be the most efficient. Due to the disparity of the viewing-coordinate grids and the voxels of the volume data after rotation, 3-dimensional interpolation is required for applying the reprojection technique. Several methods implementing linear interpolation were tried. Interpolation with a cone-shape kernel is the most appropriate in the 2D situations and can be easily extended to a sphere-shape kernel in 3D situations. The orthographic reprojection method includes a single plane dissection capability. Results on artificial test data are collected using the above algorithms. Several resulting images are included as well as the associated PASCAL programs.

536,044

AD-A153 701/8/GAR PC **A03**/MF **A01**
Rome Air Development Center, Griffiss AFB, NY.
Two-Degree-of-Freedom Linear and Planar Mircowave Array Lenses,
D. T. McGrath. Oct 84, 38p Rept no. RADC-TR-84-215

A new design of beamforming lens is presented. Both faces are planar arrays of microwave or millimeter wave antenna elements, interconnected by transmission lines (as in a 'bootlace' lens) whose length vary as a function of radius. While the front face elements are regularly space, the back face elements are displaced radially from their corresponding front face elements, the amount of displacement also being a function of radius. Such a lens is shown to be capable of forming low sidelobe pencil beams over a solid angle of + or - 25 deg or more by switching between clusters of only seven feed elements. Because both faces are planar, construction of extremely lightweight lenses for large-aperture and/or multiple-beam antennas is feasible.

536,045

AD-A153 727/3/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Sidelobe Control in Cylindrical Arrays,
Journal article,
J. C. Sureau, and K. J. Keeping. Sep 82, 6p JA-5301, ESD-TR-85-058
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in IEEE Transactions on Antennas and Propagation, vAP-30 n5 p1027-1031 Sep 82.

Low sidelobe patterns in cylindrical arrays are synthesized through the use of an artificially created noise source environment. Pattern/excitation pairs are generated by an exact formal process which optimizes the array performance. For symmetric patterns this process minimizes the signal-to-noise power ratio. For optimum antisymmetric patterns the on-axis boresight error is minimized. Sidelobe levels and rate of decay are controlled by proper selection of the angular variation of the noise amplitude.

536,046

AD-A153 743/0/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.

Tantalum Oxide Capacitors for GaAs Monolithic Integrated Circuits.
Journal article,
M. E. Elta, A. Chu, L. J. Mahoney, R. T. Cerretani, and W. E. Courtney. May 82, 4p JA-5316, ESD-TR-85-063
Contract F19628-80-C-0002
Pub. in IEEE Electron Device Letters, vEDL-3 n5 p127-129 May 82.

The performance of a high-yield tantalum oxide capacitor for use in GaAs monolithic microwave integrated circuits is described. The integral metal-insulator-metal sandwich structure is reactively sputter-deposited at low temperatures, compatible with a photoresist lift-off process, on semi-insulating GaAs substrate. Dielectric constants of 20-25 were achieved in the capacitors fabricated. An initial application of this process as an interstage coupling capacitor for a two-stage preamplifier is given.

536,047
AD-A153 768/7/GAR PC **A05**/MF **A01**
RCA Labs., Princeton, NJ.
Silicide Conductors Reliability Research.
Final rept. Jun 83-Sep 84,
T. J. Faith. Feb 85, 77p PRRL-84-CR-11, RADC-TR-85-17
Contract F30602-83-C-0109

An investigation into the reliability of polycide conductors has been performed utilizing highspeed CMOS logic circuits (QMOS) and a parametric test circuit, the contact-resistance test vehicle (CRTV). The hermetically-packages QMOS units were split into control- and test-circuit groups; control circuits utilizing standard QMOS processing with n+ polysilicon gates, test circuits utilizing n+ polysilicon/TaSi2 (polycide) gates. Relevant features of the CRTV include long, narrow (2.5 micron to 3 micron) polycide lines connected to overlying Al or Al-1%Si Kelvin-contact patterns through small (1.5 micron x 1.5 micron to 2 micron x 2 micron) interlevel contacts, and large (600 micron x 600 micron) polycide/oxide/silicon capacitors, the (3000 A polysilicon/1600 A TaSi2) polycide being separated from the silicon substrate by an unpatterned, 500 A stream-grown gate oxide. No significant degradation in either CRTV polycide line integrity or CRTV gate-oxide breakdown strength was experienced during 30 cycles of thermal shock (-70 C to +100 C).

536,048
AD-A153 916/2/GAR PC **A02**/MF **A01**
University of Southern California, Marina del Rey. Information Sciences Inst.
Electrophoretic Image Display with Internal NMOS Address Logic and Display Drivers.
Research rept.,
R. R. Shiffman, and R. H. Parker. Mar 85, 16p Rept no. ISI/RS-84-144
Contract MDA903-81-C-0335
Pub. in Proceedings of the SID, v25 n2 p105-115, 1984.

Electrophoretic image displays (EPIDs) exhibit good optical properties, reasonable response times. and very low power consumption. However, the electrophoretic effect is quite linear, thus making standard row-column addressing difficult. This paper presents a practical method for solving pixel addressing by using a custom NMOS VLSI structure as the backplane for the EPID array. A MOSFET per pixel provides the needed threshold effect for X-Y addressing individual pixels. Addition of on-chip shift registers allows serial data entry and line-at-a-time writing of the display panel, and allows expansion of the EP Array without increasing the complexity of the interface circuitry. The design, fabrication, and performance of a prototype 16 x 16 pixel matrix bit map display device is described. These results demonstrate that an NMOS VLSI wafer can be used as the backplane of an EPID, incorporating logic to solve the display addressing problem. In addition, the peripheral areas of the wafer could be utilized for an integrated display processor.

536,049
PB85-184976/GAR
(Order as PB85-184950/GAR, PC **E05**/MF **E01**)
Toshiba Corp., Tokyo (Japan).
Advanced High-Speed Bipolar Logic IC,
Y. Oida, H. Kishimoto, and M. Ueno. c1985, 4p
Text in Japanese.
Included in Toshiba Review, v40 n2 p117-120 1985.

The prescalers for satellite broadcasting and CATV converters are now required to have high-speed performances exceeding 1.2 GHz. The prescaler described herein utilizes the collector function logic (CFL) circuitry original with Toshiba to improve the speed of functions. The CFL, though similar to emitter-coupled logic (ECL) in the principle of function, is higher in speed and smaller in occupation of area. Use is made of the advanced nitride self-alined (A-NSA) process having 2-micrometer minimum feature size and 5-GHz transistor frequency.

536,050
PB85-191419/GAR PC **A03**/MF **A01**
National Bureau of Standards (NEL), Boulder, CO. Electromagnetic Fields Div.
Theory of Mutual Impedances and Multiple Reflections in an N-Element Array Environment.
Technical note,
L. A. Muth. Feb 85, 36p NBS-TN-1078
Also available from Supt. of Docs as SN003-003-02632-8.

A general theoretical approach is formulated to describe the complex electromagnetic environment of an N-element array. The theory reveals the element-to-element interactions and multiple reflections within the array. From the formulation, it is found that the interaction between an excited element and an open-circuited element can be viewed as the sum of terms describing all possible signal paths within the array environment which start from the radiating element and terminate on the element under observation. Within all paths except the most direct one, multiple reflections between subgroups of elements take place. The resulting solution is highly structured and recursive and is discussed in detail in the text. Illustrative examples are provided to facilitate understanding of these ideas.

536,051
PB85-209484/GAR
(Order as PB85-209443/GAR, PC **E05**/MF **E01**)
Mitsubishi Electric Corp., Tokyo (Japan).
Interactive Electronic-Circuit Simulation Using a CAE (Computer-Aided Engineering) Workstation,
S. Shimpo, M. Murai, T. Shimizu, and T. Tsutsui.
c1985, 4p
Text in Japanese.
Included in Mitsubishi Denki Giho, v59 n2 p19-22 1985.

Circuit-simulation has proven a rapid and effective means of verifying circuit designs developed for new ICs and LSIs. A CAE workstation has been developed to provide a facile interface between the designer and the computer in an interactive electronic-circuit simulation system designed to improve the efficiency of circuit design and simulation. The article describes this system and its workstation.

536,052
PB85-861466/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Printed Wiring Devices. 1970-June 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-Jun 85.
Jun 85, 146p

This bibliography contains citations of selected patents concerning the design and manufacturing methods employed in the fabrication of printed wiring (PW) devices and equipment. The utilization of composite materials, and methods of fabricating PW boards, cards, and sheets are analyzed. Electrical and mechanical connector construction and substrate materials descriptions are discussed. Applications in electric and electronic switch equipment are reviewed. (Contains 191 citations fully indexed and including a title list.)

536,053
PB85-861714/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Integrated Circuits Reliability. June 1974-May 1984 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 74-May 84.
Jun 85, 237p
Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the reliability and fatigue life of electronic circuits subjected to temperature cycling in an environmental chamber. Applications in military aircraft and spacecraft electronic equipment are examined. Reliability testing devices are discussed relative to performance evaluations and utilization. (This updated bibliography contains 294 citations, none of which are new entries to the previous edition.)

536,054
PB85-861722/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Integrated Circuits Reliability. June 1984-June 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 84-Jun 85.
Jun 85, 61p
Supersedes PB84-867167. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the reliability and fatigue life of electronic circuits subjected to temperature cycling in an environmental chamber. Applications in military aircraft and spacecraft electronic equipment are examined. Reliability testing devices are discussed relative to performance evaluations and utilization. (This updated bibliography contains 59 citations, all of which are new entries to the previous edition.)

536,055
PB85-861771/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phase Locked Loop. July 1983-June 1985 (Citations from the Engineering Index Data Base).
Rept. for Jul 83-Jun 85.
Jun 85, 98p
Supersedes PB84-867647.

This bibliography contains citations concerning the theory, design, testing, development, performance characteristics, and applications of various phase locked loop circuits and devices. Topics include stability analysis and control systems for phase locked loops, frequency synthesizers and estimators, phase detectors, and phase locked loop modulation and demodulation. (This updated bibliography contains 136 citations, 64 of which are new entries to the previous edition.)

536,056
PB85-862126/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Printed Circuit Solderability: Techniques and Materials. 1975-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-Jun 85.
Jun 85, 72p
Supersedes PB84-869577.

This bibliography contains citations concerning technical and material considerations for printed circuit solderability. Solderability assurance, testing, requirements, and analysis are discussed. Solderable materials, soldering process and performance evaluation, and solder defects are considered. Discussions also include coating techniques for preserving solderability and materials for solderability protection. (This updated bibliography contains 91 citations, 11 of which are new entries to the previous edition.)

536,057
PB85-862217/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Printed Circuits: Soldering and Connectors. August 1982-June 1985 (Citations from the Engineering Index Data Base).
Rept. for Aug 82-Jun 85.
Jun 85, 89p
Supersedes PB84-870765.

This bibliography contains citations concerning electrical connectors for, and soldering of, printed circuit boards. Soldering includes some introductory articles as well as more advanced techniques involving automation, vapor phase soldering, wave soldering, reflow soldering, and soldering fluxes. Connectors include references to types and standards and assembly of connectors to the boards. A few citations reference

force-fitting of connectors. (This updated bibliography contains 131 citations, 67 of which are new entries to the previous edition.)

536,058
PB85-862241/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phase Shifters. 1978-June 1985 (Citations from the Engineering Index Data Base).
Rept. for 1978-Jun 85.
Jun 85, 100p
Supersedes PB83-801993.

This bibliography contains citations concerning the design, performance, and applications of phase shifter devices and circuits. Topics include operational characteristics and performance evaluations of specific devices, design and fabrication considerations, modulation and calibration aspects, and reliability studies. Voltage controlled, ferrite, and semiconductor phase shifters are among the types reviewed. Applications include phased array antennas, microwave equipment, control equipment, and surface acoustic wave devices. (This updated bibliography contains 151 citations, 39 of which are new entries to the previous edition.)

536,059
PB85-862266/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Television Receiving Antennas. 1975-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-Jun 85.
Jun 85, 138p
Supersedes PB84-870039.

This bibliography contains citations concerning a large variety of television receiving antennas, ranging from residential roof-top designs to satellite receiving and transmitting antennas used for television transmission. Home satellite dish designs, and some experimental antennas are discussed. Methods employed to improve reception, including the use of receiving amplifiers, and circuits for blocking ghosts, are reviewed. (This updated bibliography contains 191 citations, 61 of which are new entries to the previous edition.)

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

536,060
AD-A153 642/4/GAR PC **A05**/MF **A01**
Logistics Management Inst., Bethesda, MD.
Measuring Energy Efficiency in the Department of Defense.
Final rept.,
B. L. Murrie. Feb 84, 82p Rept no. LMI-ML303
Contract MDA903-81-C-0166

We conclude that energy productivity ratios--overall or at lower, functional levels, e.g., for mobility operations--are usually infeasible. Even at the less highly aggregate levels, such as military airlift or aircraft depot maintenance, individual operational outputs are difficult to define and measure and impossible to combine. At the specific operational levels where outputs can be identified and defined, energy consumption, the denominator of the productivity ratio, is usually metered at too high a level to permit linkage with outputs. We recommend that DoD abandon its attempts to develop energy productivity ratios to evaluate energy consumption and that it adopt two other analytical methods. The first method is trend analysis of energy intensity ratios--ratios of energy consumption costs to total outlays at several levels of aggregation. Differentiating among activities according to their energy intensity trends will allow management attention to be concentrated where potential energy savings are highest. Where they are, we recommend a second analytical method, quantitative relationships, by activity, between energy consumption and the principal activities and factors (e.g., flying hours, base population) associated with it. Using these relationships DoD managers can obtain and understanding of energy consumption impacts. They will be able to determine whether changes in consumption are significant, and thus will have a basis for setting meaninful energy goals.

536,061
DE85008486/GAR PC **A11**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Residential and Commercial Buildings Data Book.
Oct 84, 237p DOE/RL/01830-16
Contract AC06-76RL01830
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

A current and reliable source of information on building characteristics and energy consumption patterns is a fundamental requirement for effective R and D and program planning in the Office of Building Energy Research and Development (BERD). This document is intended to complement other BERD information sources by compiling the most current data on the stock characteristics of residential and commercial buildings, building stock energy consumption, historical trends, and forecasts. The information contained herein was assembled to make data from diverse sources more readily available to BERD project managers and staff. The data will assist the BERD staff perform two vital functions: determine areas in which research to improve energy productivity might provide significant energy savings; and estimate the actual effect that specific research projects may have on energy productivity and conservation in the buildings sector. These functions are important because the BERD program is responsible for establishing the general direction of a major, long-term research program and for initiating specific research projects that will eventually fulfill the program goals. Current plans call for this document to be updated and revised from time to time as new and better data become available. Accordingly, users of this data book are encouraged to submit requests, information, or comments to the Pacific Northwest Laboratory to enhance the usefulness of future editions. This report is divided into three main sections: Overview of Selected Energy Variables; Residential Buildings; and Commercial Buildings. The Overview contains historical total US energy consumption by major sector; historical and projected fuel prices; and forecasts of residential and commercial sector activity. (ERA citation 10:022792)

536,062
DE85008626/GAR PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Absorber Coatings' Degradation.
S. W. Moore. 1984, 11p LA-UR-84-1745, CONF-840676-1
Contract W-7405-ENG-36
Renewable energy technologies symposium and international exposition, Anaheim, CA, USA, 5 Jun 1984.

This report is intended to document some of the Los Alamos efforts that have been carried out under the Department of Energy (DOE) Active Heating and Cooling Materials Reliability, Maintainability, and Exposure Testing program. Funding for these activities is obtained directly from DOE although they represent a variety of projects and coordination with other agencies. Major limitations to the use of solar energy are the uncertain reliability and lifetimes of solar systems. This program is aimed at determining material operating limitations, durabilities, and failure modes such that materials improvements can be made and lifetimes can be extended. Although many active and passive materials and systems are being studied at Los Alamos, this paper will concentrate on absorber coatings and degradation of these coatings. (ERA citation 10:022582)

536,063
DE85008680/GAR PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
CO Sub 2 Trends in the Depletion of the Larderello Vapor-Dominated Reservoir.
K. Pruess, R. Celati, C. Calore, and F. D'Amore. Jan 85, 8p LBL-19092, CONF-850107-8
Contract AC03-76SF00098
10. annual workshop on geothermal reservoir engineering, Stanford, CA, USA, 22 Jan 1985.

The present paper is concerned with the origin of CO sub 2 in the Larderello discharges from a reservoir engineering point of view. Specifically, we consider the question of fluid reserves (water and CO sub 2) at Larderello, and we carry out numerical simulations to obtain insight into temporal trends of CO sub 2 released from idealized models of vapor-dominated systems. Important constraints in the modeling arise from observed temperatures and enthalpies at Larderello. Discharge enthalpies are generally close to those of saturated steam near 250 exp 0 C (2.8 MJ/kg), with some degree of superheat which tends to increase with time. Flow rates of most wells decrease rapidly during the first few years of production and subsequently decline very slowly. (ERA citation 10:022590)

536,064
DE85009332/GAR PC **A07**/MF **A01**
Energy Applications, Columbia, MD.
Technical Support Document: Energy Use Projections for Four Consumer Products.
Mar 85, 126p DOE/CS/20315-1
Contract AC01-79CS20315
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

This report summarizes an investigation conducted to forecast the amount of energy savings which could be attributed to energy efficiency standards for four consumer products as well as to determine the economic impact of such standards on consumers. The four consumer products are dishwashers, television sets, clothes washers, and humidifiers and dehumidifiers. Energy savings were forecasted for two levels of energy efficiency standards. Since the standard levels selected were greater than the energy efficiency at the minimum life cycle point, energy efficiency standards could result in increased life cycle costs for all four products. Sensitivity analyses were conducted to determine the effect that different projections of consumer purchasing behavior during a no-standards scenario would have on the forecasts of energy savings. Standards for the four products probably would not result in significant conservation of energy. The economic impact of such standards could result in higher first costs and increased life cycle costs for all four products. (ERA citation 10:020824)

536,065
DE85009396/GAR PC **A03**/MF **A01**
Thermal Services, Inc., Wilmington, DE.
Thermographic Inspection in Building Energy Conservation. Final Report.
G. S. Baird, and K. M. Ulbinsky. 30 Nov 82, 47p DOE/R3/08062-T1
Contract FG43-81R308062

Infrared inspections are capable of defining building envelope characteristics not determinable by walkthrough inspections. Infrared inspection correctly diagnosed the building envelope characteristics, infiltration and exfiltration losses in the two studies made. In these two cases the major energy loss problems were observed and are documented in the walkthrough inspection reports. Thermographic inspection did not add significantly to the economic impact of the findings in these particular cases. However, the full capabilities of the infrared technique were not utilized, i.e., quantitative information was not obtained on the roofing systems. Infrared did define the problems within the scope of the inspection. R values can be determined with a degree of precision and with good agreement between infrared and Btu flowmeter techniques. The infrared technique is esecially useful for quantifying inaccessible surfaces. The Btu flowmeter is useful for determining heat flow characteristics over long periods as it is amenable to chart recording. (ERA citation 10:020864)

536,066
DE85009451/GAR PC **A20**/MF **A01**
Oak Ridge National Lab., TN.

Past Efforts and Future Directions for Evaluating State Energy Conservation Programs.
N. E. Collins, L. G. Berry, R. B. Braid, D. W. Jones, and C. R. Kerley. Apr 85, 463p ORNL-6113
Contract AC05-84OR21400
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

This report is a part of a larger effort to provide information to states that will help them plan and carry out evaluations of energy conservation programs. It reviews the existing literature on evaluations of conservation programs, provides a summary of the evaluation designs which have been used, evaluates the reliability and validity of the designs, indicates what the results of the evaluations have been, suggests directions that evaluators should consider, and, as appropriate, discusses implications for state energy conservation programs. (ERA citation 10:020782)

536,067
DE85009497/GAR PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Analysis of Anions in Geological Brines Using Ion Chromatography.
R. M. Merrill. Mar 85, 31p SAND-84-2297
Contract AC04-76DP00789

Ion chromatographic procedures for the determination of the anions bromide, sulfate, nitrite, nitrate, phosphate, and iodide in brine samples have been developed and are described. The techniques have been applied to the analysis of natural brines, and geologic evaporites. Sample matrices varied over a range from 15,000 mg/L to 200,000 mg/L total halogens, nearly all of which is chloride. The analyzed anion concentrations ranged from less than 5 mg/L in the cases of nitrite, nitrate, and phosphate, to 20,000 mg/L in the case of sulfate. A technique for suppressing chloride and sulfate ions to facilitate the analysis of lower concentration anions is presented. Analysis times are typically less than 20 minutes for each procedure and the ion chromatographic results compare well with those obtained using more time consuming classical chemical analyses. 10 references, 14 figures. (ERA citation 10:022931)

536,068
DE85009513/GAR PC **A02**/MF **A01**
Grass Roots Alliance for a Solar Pennsylvania, Philadelphia.
Application of Energy Savings in an Urban Setting. Final Report.
H. Greenberg. 15 Mar 82, 17p DOE/R3/08086-T1
Contract FG43-81R308086
Portions of this document are illegible in microfiche products.

The South Philadelphia Energy Education Program was run as a part of GRASP's ongoing Community Energy Education Program (CEEP). CEEP helps neighborhood groups to build local resources to meet local energy needs through educational workshops, energy training sessions, and the establishment of cooperative energy programs. The South Philadelphia program was conducted in a largely new geographic area where support for GRASP programs had not been previously generated. Thus while the program was not markedly successful in terms of numbers of residents reached with energy information, the program did lend itself well to establishing the basis for future programs in this geographic area. With 13 community residents trained as neighborhood energy auditors, a good base has been established for community groups to run their own programs. GRASP will continue to work with interested groups in this area. (ERA citation 10:022820)

536,069
DE85009657/GAR PC **A11**/MF **A01**
Bonneville Power Administration, Portland, OR. Div. of Power Forecasting.
Bonneville Power Administration Forecasts of Electricity Consumption in the Pacific Northwest.
Nov 84, 245p DOE/BP-409

This document presents a 20-year forecast of electricity consumption in the Pacific Northwest, for the years 1984 to 2004. It represents the second annual update of BPA's long-range forecast, to be used to meet BPA internal planning needs. The forecast consists of high, medium, and low case scenarios. By developing a range of load projections, the medium projection is produced by merging the results from separate long-term and midterm forecasting models. The high and low projections were produced using the long-term forecasting models only. The long-term forecast is produced using a series of demand models (each addressing a specific consuming sector) in conjunction with an electricity supply pricing model. These models provide a detailed breakdown of energy use, but they are not sensitive to monthly weather conditions, business cycles, or economic fluctuations which might prove significant in the near future. BPA's midterm forecasting models are designed specifically to be responsive to such factors, allowing them to be captured in the final medium case load forecast which merges the long-term and midterm model results. These midterm models econometrically forecast monthly energy demand by state but without any detail by consuming sector. (ERA citation 10:020787)

536,070
DE85009773/GAR PC **A10**/MF **A01**
Oregon Univ., Eugene. Solar Radiation Monitoring Lab.
Pacific Northwest Solar Radiation Data.
1 Apr 85, 221p DOE/BP/24574-1
Contract AC79-81BP24574
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

A brief historical sketch is first presented outlining the establishment of the monitoring network and detailing some of the motivation for creating the network. The data analysis procedures are then outlined showing what happens once the data is received and explaining the checks made to ensure the accuracy of the data. Next the calibration of the sensors is discussed. Calibration of the instruments is essential in maintaining the accuracy of the data. The importance of char records is stressed in the following section. Then a few of the important results obtained from our analysis of the data are described, including comparisons with other sites and frequency distributions. In the next section we look at the possible effect on the data of the volcanic eruption of El Chichon in Mexico and discuss the possible effects of El Nino on the 1983 data. The last section before the data concerns empirical correlations determined for the Pacific Northwest. These correlations are used as the first step to determine the amount of solar radiation on a tilted surface. The data are presented in two sections. The first section contains monthly averaged data for all the sites. The monthly averaged data are given in two forms. First the hourly data for each month are averaged over the number of years for which the data are available. Then the average daily value for the month is given for each month in the data set. The overall monthly averaged daily value is also given in the same table. The last section contains a listing of all the daily solar radiation values collected by the UO network. (ERA citation 10:022517)

536,071
DE85010938/GAR PC **A07**/MF **A01**
Department of Energy, Washington, DC. Office of Energy Markets and End Use.
Documentation of the Integrating Module of the Intermediate Future Forecasting System.
Mar 85, 131p DOE/EIA-M005

This report describes the central integrating module (MAIN) in the Intermediate Future Forecasting System (IFFS) that was used to produce the energy forecasts published in the Annual Energy Outlook 1984. IFFS is a partial equilibrium model of the energy markets. The model consists of four supply modules, a stock module, a macroeconomic module, five demand modules, and the central integrating module whose primary function is to direct the execution sequence of the other modules. A brief description is given of the total system, but the focus of the report is on the integrating module. In addition, three supporting programs for IFFS, the database, the run submission, and the reporting systems are described briefly. 23 references, 5 figures. (ERA citation 10:022742)

536,072
DE85780304/GAR PC **A03**/MF **A01**
Ministerio das Minas e Energia, Brasilia (Brazil).
1982 Highlights (Brazilian Energy and Mines Ministry).
1983, 41p INIS-BR-132
In Portuguese.
U.S. Sales Only.

A short report of the activities of the Brazilian Energy and Mines Ministry, MME, is presented, emphasizing the most important facts that happened in its several areas of actuation during 1982. Through a simple and objective communication, those facts are shown. (Atomindex citation 15:057078)

536,073
DE85780469/GAR PC **A04**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
Department of Energy Technology (Risoe National Laboratory, Denmark). Annual Progress Report 1 January-31 December 1983.
Jan 84, 54p RISO-R-494
U.S. Sales Only.

The general development of the Department of Energy Technology at Risoe during 1983 is presented, and the activities within the major subject fields are described in some detail. Lists of staff and publications are included. (Atomindex citation 15:073362)

536,074
DE85780492/GAR PC **A06**/MF **A01**
Ministerio das Minas e Energia, Brasilia (Brazil).
National Energy Balance.
1983, 116p INIS-BR-218
In Portuguese.
U.S. Sales Only.

The energy fluxes of the several primary and secondary energy sources, since the production to the final consumption in the main economic sectors, are presented. A historical series covering ten years - 1973 to 1982, and the information retrieval related to the year of 1970 are also presented. (Atomindex citation 15:073357)

536,075
DE85780602/GAR PC **A04**/MF **A01**
Hauptberatungsstelle fuer Elektrizitaetsanwendung e.V., Frankfurt am Main (Germany, F.R.).
HEA - For a Better Understanding of Technology. Energy as a Subject for Training and Further Education.
1983, 67p INIS-mf-9205, CONF-8310333-
In German.Autumn meeting of the Hauptberatungsstelle fuer Elektrizitaetsanwendung e.V. Wiesbaden, F.R. Germany, 20 Oct 1983.
U.S. Sales Only.

To the consultative and informative tasks of the EVU should be added a new dimension: over and above the technological-economic aspects, aims, benefit and effects of energy exploitation on the environment, surroundings and posterity should be made clear. The consequences which could result from a stagnation or retrograde developments in the technological-economic field are also shown. The four concrete objectives of the HEA congress are: demonstration of the spectrum of opinion, consequences for adult education, value assessment of teacher training and in-service training and the way it comes through in practice in the various types and levels of schools, and the present situation and outlook of school information. (Atomindex citation 15:068582)

536,076
DE85780636/GAR PC **A03**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
Energy Systems Group (Risoe National Laboratory, Denmark). Annual Progress Report 1 January-31 December 1983.
G. A. Mackenzie, and H. Larsen. Mar 84, 39p RISO-R-497
U.S. Sales Only.

The report describes the work of the Energy Systems Group at Risoe National Laboratory during 1983. The activities may be roughly classified as energy planning, development and use of energy-economy models, energy systems analysis, and energy technology assessment. The report includes a list of staff members, as well as their experience and areas of interest. (Atomindex citation 15:070610)

536,077
DE85780676/GAR PC **A05**/MF **A01**
Teldersstichting (B.M.), The Hague (Netherlands).
Energy Policy for the Future. Report No. 45.
B. P. Rauwerda, J. H. Bakker, and A. G. Egressy.
1982, 85p INIS-mf-9420
In Dutch.Published about 1982.
U.S. Sales Only.

This writing deals with policy-analytical aspects of the energy problem. Considerable attention is paid to the international uncertainties, restrictions and other aspects that are important in formulating a Dutch energy policy. It is shown that the Netherlands are not able and allowed to seclude itself internationally. But it may not disregard its own national situation either. Next, the Dutch energy situation, some previous prognoses and some national aspects of energy supply are discussed. An inventory of possible policy instruments is offered in the next section. In the last two sections, different energy plans are confronted with the above mentioned national and international aspects. Nuclear power is only discussed in the general framework of the energy problem. (Atomindex citation 15:070536)

536,078
PB85-181907/GAR PC **E04**/MF **E04**
Open Univ., Milton Keynes (England). Energy Research Group.
Linford Low Energy Houses. Project Summary,
R. Everett, A. Horton, and J. Doggart. c1985, 47p ERG-051, ESTU-S-1025(S)
Sponsored by Department of Energy, London (England).

The Linford Project involved the design, construction and monitoring of eight low energy houses in Milton Keynes, a new town, about 50 miles north of London. The objective was to monitor the houses in a considerable amount of detail to assess the interactive effects of high levels of insulation, passive solar and incidental heat gains and the performance of the heating system.

536,079
PB85-186435/GAR PC **E06**/MF **E06**
Commission of the European Communities, Luxembourg.
EFOM-12C/GRESOM-6 (Energy Flow Optimization Model-12C/Greek Energy System Opitmtzation Model-6): A Model for the Greek Energy System.
Final rept.,
J. E. Samouilids, A. Arabatzi-Ladia, K. Constantinidou, K. Despotakis, and J. Psarras. c1984, 123p EUR-9170-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The EFOM-12C/GRESOM-6 model for the Greek energy system employs the software of the EEC's Energy Flow Optimization Model (EFOM-12C) and the subsystems description of the Energy Policy Unit's (NTUA) Greek Energy System Optimization Model (GRESOM-6). The aim of the model is not the forecast of the energy future but rather the analysis and evaluation of a variety of alternative scenarios for the evolution of the Greek energy system up to the year 2020. Thus the model could be a valuable and reliable analytical tool in the hands of energy policy makers. Results of four alternative scenarios and the 'Escalating Supply Rationing' case study are presented.

536,080
PB85-187144/GAR PC **E15**/MF **E15**
Open Univ., Milton Keynes (England). Energy Research Group.
Linford Low Energy Houses,
R. Everett, A. Horton, and J. Doggart. c1985, 436p ERG-50, ETSU-S-1025
Sponsored by Department of Energy, London (England).

This is the final report on the performance of 8 low-energy, passive solar houses at Great Linford, Milton Keynes, monitored by the Open University Energy Research Group (ERG), for the Milton Keynes Development Corporation (MKDC), under contract to the Energy Technology Support Unit (ETSU) at Harwell. (Copyright (c) Crown Copyright 1985.)

536,081
PB85-189660/GAR PC **E05**/MF **E05**
Commission of the European Communities, Luxembourg.
Energy Saving in the Commercial Catering Market.
Final rept.,
T. G. Enga. c1984, 91p EUR-9269-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The cost of cooking a meal comprises food costs, labor charges, overheads and energy costs, the last item being a very small part of total costs. However, significant savings in energy consumption can be easily made using existing designs. Areas of appliance design, control and usage have been investigated and the potential for waste heat recovery from kitchens assessed. The catering gas consumption could be reduced by 3% if all gas catering appliances were optimized. A further 2% saving could be made by adopting the best currently available designs. Improvements in kitchen management and appliance usage could reduce consumption by another 5% and waste heat recovery, equivalent to 3% of gas consumption, is feasible for larger kitchens in hotels, restaurants, canteens and institutions.

536,082
PB85-189942/GAR PC **E11**/MF **E11**
Commission of the European Communities, Luxembourg.
Energy Conservation on Exposed Domestic Sites.
Final rept.,
F. O'Farrell, G. Lyons, and G. Lynskey. c1984, 252p EUR-9238-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The internal heat gains from solar radiation in two unoccupied isolated houses resulting from external climatic factors were recorded over a two year period at Oakpark Research Center, Carlow, Ireland. Different recording regimes were undertaken with altered site characteristics mostly windbreaks. Using the monitored data, regression models for each regime were generated which related internal ambient temperature to the external climatic parameters. A model was developed to withstand the difficulties imposed by short monitoring periods, and these regression models were used to predict internal temperatures for a standard reference year. Thus resulting energy saving for different site characteristics were estimated. The savings due to the erection of a windbreak were in the region of 5% to 10% and the savings from the use of a standard low energy house was about 70% over a basic house. The possible implications of these savings for Ireland and Europe are outlined.

536,083
PB85-193167/GAR PC **E04**/MF **E01**
Ben-Gurion Univ. of the Negev, Beorsheba (Israel). Applied Research Inst.
Development of Flat-Plate Solar Collector-Evaporator.
Rept. for 11 Jan 80-31 Mar 81,
B. Abramzon, and I. Yaron. Apr 81, 61p BGUN-RDA-310-81
Sponsored by Ministry of Energy and Infrastructure, Tel-Aviv (Israel).

The stage of the project reported herein has been devoted to the elaboration of the simulation model of the flat-plate solar collector-evaporator. Work at this stage was restricted to the analysis of the performance characteristics of a collector-evaporator operating with a single-component fluid, emphasizing the possible utilization of the collector to generate vapors, required to drive a gas turbine. Methods for the calculation of the amount of solar radiation absorbed by the collector's surface, of the coefficient of heat losses from the collector, and of the heat transfer coefficient in the tubes with possible boiling phenomena are presented in detail. The operation of the simulation program is explained at some length, and some results of the analysis of a flat-plate solar collector-evaporator on the basis of this simulation program are presented.

536,084
PB85-194926/GAR PC **A99**/MF **A01**
Asian Inst. of Tech., Bangkok (Thailand).
US-ASEAN (United States-Association of South East Asian Nations) Seminar on Energy Technology: Biomass, Coal, Solar/Wind, Energy Planning Held at Bundung, Indonesia on 7-18 June 1982,
D. I. Hertzmark. Nov 82, 651p AID-PN-AAN-742

Five national energy status reports are first presented (Thailand, Singapore, Philippines, Malaysia, Indonesia). Twelve papers on biomass technology follow, including a state-of-the-art paper and a summary report which recommends research (on energy plantations, thermo-chemical combustion, pyrolysis, gasification, and bioconversion) and information dissemination. Five papers on coal energy include an overview of coal conversion processes and research/development (R&D) in lignite energy conversion. Fourteen papers on solar and wind energy are followed by eight general reports on such topics as energy planning in developing countries, planning and programming alternative energy R&D, a systems approach to nonconventional energy problems, and an overview of energy resources. A final paper by the ASEAN Energy Planning Group outlines needs (better data, improved modeling, and net pricing regimes) and recommendations for analysis and implementation of energy programs. References follow many of the papers.

536,085
PB85-195162/GAR PC **E04**/MF **E04**
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
OPTIMO - A Method for Assessing the Energy Saving Potential in Public-Property Buildings,
G. Graziani, M. Paruccini, and C. Zanantoni. c1984, 65p EUR-9132-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

OPTIMO is a method that allows us to identify the ranking in the conservation measures for which the energy saving for a given investment is maximum. The method can be used in principle for only a fraction of the building stock: the dwellings for which the decision on conservation measures can be taken, by a single economic actor, over a large number of buildings; typically the State-owned buildings. When used for the entire building stock OPTIMO gives an upper limit of the energy saving potential. The minimization is performed taking into account the physical and economic characteristics of the conservation measures (typically the initial conductance and the added thermal resistance). As a result of the minimization procedure, both the extent to which these measures are applied and the order in which they are chosen will be known. (Copyright (c) ECSC-EEC-EAEC, Brussels, Luxembourg, 1984.)

10B. Power Sources

536,086
AD-A153 438/7/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Efficient Si Solar Cells by Low-Temperature Solid-Phase Epitaxy.
Journal article,
B. Y. Tsaur, G. W. Turner, and J. C. C. Fan. 1 Jun 81, 4p JA-5218, ESD-TR-85-044
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v39 n9 p749-751, 1 Nov 81.

Solid-phase epitaxial Si layers of uniform thickness have been grown at 400-500 C by transport of Si atoms from an amorphous Si film through an AL film deposited on (100) single crystal or polycrystalline n-type Si substrates. The epitaxial Si layers are strongly p type due to Al doping, and good rectifying junctions are formed between these layers and the substrates. Solar cells with conversion efficiencies at AM1 of 10.4 and 8.5% have been fabricated on (100) Si and polycrystalline Si substrates, respectively, without the use of an antireflection coating or back surface field structure.

536,087
AD-A153 715/8/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Efficient GaAs Solar Cells Formed by UV Laser Chemical Doping.
Journal article,
T. F. Deutsch, J. C. C. Fan, D. J. Ehrlich, G. W. Turner, and R. L. Chapman. 15 Apr 82, 4p JA-5326, ESD-TR-85-069
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v40 n8 p722-724, 15 Apr 82.

ArF and ZeF excimer laser radiation has been used to form p-n junctions in GaAs. The laser release S atoms by the dissociation of H2S gas and simultaneously heats the substrate to allow incorporation of the S dopant. Solar cells having AM1 efficiencies of 10.8% have been fabricated from these junctions. The process can also produce doped GaAs layers with sheet resistances as low as 30 ohms/sheet.

536,088
DE85002939/GAR PC **A06/MF A01**
Solar Energy Research Inst., Golden, CO.
SERI (Solar Energy Research Institute) Photovoltaic Advanced Research and Development Project. FY 1984 Accomplishments.
Mar 85, 109p SERI/SP-216-2628
Contract AC02-83CH10093

This summary of FY 1984 accomplishments containing the technical highlights of SERI's program in photovoltaics research and development and a bibliography of technical publications. Also included are several management highlights. Selected accomplishments are categorized according to research tasks identified in the DOE National PV Program Five-Year Research Plan. The DOE task areas appearing here are Single-Junction Thin Films, High-Efficiency Multijunction Concepts, Innovative Concepts, Silicon Materials, Flat-Plate Collectors, and System Experiments. Subcontract program categories are Amorphous Thin Films, High-Efficiency Concepts, Polycrystalline Thin Films, Crystalline Silicon, and Innovative Concepts which is subdivided into New Ideas and Photoelectrochemical Cells. SERI internal PV task areas are PV Devices and Measurements, Solid State Research, Insolation Resource Assessment, Advanced PV Systems Research, and Solar Electric Research activities. The bibliography is a compilation of the technical publications resulting from all SERI research during FY 1983 and FY 1984. The entries are presented alphabetically by author. 372 references. (ERA citation 10:020255)

536,089
DE85004565/GAR PC**$23.00/MF A01**
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center.
Fuel Cells. A Bibliography.
W. H. Kinser. Apr 85, 436p DOE/METC-85/15, DOE/TIC-3359-Sup.2

This compilation includes approximately 1900 citations of foreign and domestic reports, journal articles, patents, conference papers and proceedings, monographs, and books. The citations were taken from the DOE Energy Data Base covering the period July 1980 through February 1985. The citations are arranged in subject categories as shown in the table of contents. Within each category the report citations are arranged alphanumerically by report number, and nonreport literature citations are arranged in reverse chronological order. Corporate Author, Personal Author, Subject, Contract Number, and Report Number indexes are provided. This bibliography is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161. Information on fuel cells prior to July 1980 is included in reports TID-3359 and TID-3359(Suppl-1) which are also available from NTIS. (ERA citation 10:022760)

536,090
DE85006773/GAR PC **A02/MF A01**
Arizona Public Service Co., Phoenix.
Airport Solar Photovoltaic Concentrator: Phase 3. Project Status Report No. ASPCP III-11, October 1-December 31, 1984.
1985, 8p DOE/ET/20624-T11
Contract AC04-80ET20624

The objective of the work reported is to operate and evaluate for three years a photovoltaic system installed at an airport. The system consists of an 80-array subsystem with a nominal rating of 225 peak kilowatts dc output at the array field. Installation of a new inverter is reported. A fire was caused by an electrical short to ground inside one of the solar cell modules and began spreading throughout one of the arrays, causing extensive damage. Fuses were installed in series with the blocking diodes to prevent high reverse currents. (ERA citation 10:022547)

536,091
DE85007038/GAR PC **A18/MF A01**
Akademiya Nauk SSSR, Moscow. Inst. Vysokikh Temperatur.
Eighth International Conference on MHD Electrical Power Generation. Volume 2.
1983, 414p DOE-tr-273-V.2, CONF-830906-Vol.2-Trans.
Translation source information not available .International conference on MHD electrical power generation, Moscow, USSR, 12 Sep 1983.
Portions of this document are illegible in microfiche products.

The proceedings contain the results of most recent R and D work aimed at practical realization of this advanced method of electrical power generation. The papers presented to the Conference deal with heat-generating schemes and cycles, conceptual and detail designs of MHD power plants, including that of the first commercial 500-MW power-generating unit presently under construction in the USSR. Research results are described obtained in pilot and experimental facilities in the USSR, USA, Poland, Japan, Netherlands and other countries. This volume contains 46 papers arranged under the following session headings: MHD flows and electromagnetic field; heat transfer in channel and working medium; and MHD components (loading system, magnet). (ERA citation 10:022758)

536,092
DE85007039/GAR PC **A19/MF A01**
Akademiya Nauk SSSR, Moscow. Inst. Vysokikh Temperatur.
Eighth International Conference on MHD Electrical Power Generation. Volume 1.
1983, 441p DOE-tr-273-V.1, CONF-830906-Vol.1-Trans.
Translation source information not available .International conference on MHD electrical power generation, Moscow, USSR, 12 Sep 1983.
Portions of this document are illegible in microfiche products.

The proceedings of the VIIIth International Conference on MHD Electrical Power Generation contain the results of most recent R and D work aimed at practical realization of this advanced method of electrical power generation. The papers presented to the Conference deal with heat-generating schemes and cycles, conceptual and detail designs of MHD power plants, including that of the first commercial 500-MW power-generating unit presently under construction in the USSR. Research results are described obtained in pilot and experimental facilities in the USSR, USA, Poland, Japan, Netherlands and other countries. This volume contains 44 papers arranged under the following session headings: conceptual designs, scheme analysis and mathematical modeling of MHD power plants; experimental and pilot MHD facilities; testing, designing and modeling of MHD channels; and electrode phenomena and plasma processes. (ERA citation 10:022757)

536,093
DE85007770/GAR PC **A06/MF A01**
Tennessee Univ. Space Inst., Tullahoma.
User's Manual for the UTSI MHD/Steam Power Plant Systems Code.
J. N. Chapman, E. H. Kiessling, M. C. Altstatt, and C. D. Prather. Jan 85, 115p DOE/ET/10815-98, UTSI-85-01
Contract AC02-79ET10815
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

This report is a User's Manual for the UTSI Systems Code for analysis of the cost/performance of combined cycle MHD steam power plants. In addition to the original code, it contains the NASA SP-273 code for chemical equilibrium calculations and PRESTO steam plant code which was originated by the General Electric Company and modified by Oak Ridge National Laboratories and NASA. This document describes the new code and its application but does not attempt to reproduce the documents describing the SP-273 and PRESTO codes. A new one-dimensional generator code is provided which was developed from other UTSI codes specifically for integration into this Systems Code. An alternative is provided so that the user can enter the required generator characteristics from an external calculation. The report describes the required inputs and outputs produced. It also describes the calculational methodology so that a potential user can modify or expand any calculation as required. New and substantially modified code is provided in the appendices, along with sample inputs and outputs. (ERA citation 10:022753)

536,094
DE85008027/GAR PC **A04/MF A01**
Tallahassee, FL.
Jackson Bluff Hydroelectric Project: Emergency Action Plan, City of Tallahassee.
May 84, 52p DOE/ID/12128-T1
Contract FC07-80ID12128
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

Jackson Bluff Dam is located on the Ochlockonee River about 66 miles upstream from its mouth at the Gulf of Mexico and approximately 20 miles west-southwest of the City of Tallahassee. The site is situated in Leon, Gadsden, and Liberty counties. The dam consists of a 3600 ft long earth embankment with the crest at EL. 77 (MSL). About 1000 ft north of the end of the main dam is a saddle dam. The saddle dam is approximately 550 ft long and has crest at EL 72.3 (4.7 ft below the main dam). The gated spillway and the powerhouse are located at the southeast end of the dam. The purpose of the Emergency Action Plan is to specify actions to be taken in the event of flooding of the downstream of the Ochlockonee River due to failure of the dam. (ERA citation 10:022513)

536,095
DE85008668/GAR PC **A05/MF A01**
Systems Control, Inc., Palo Alto, CA. Energy Systems Div.
Alternative Methods for Achieving Given Power System Reliability Levels. Final Report.
Z. A. Yamayee, R. W. Boardman, S. U. Khan, and F. S. Ma. Oct 80, 90p DOE/RG/10366-T1
Contract AC01-80RG10366
Portions of this document are illegible in microfiche products.

This work examines the relative cost-effectiveness of competing electrical generating alternatives in contributing to the overall reliability level of a utility system. Three principal issues raised by Section 209 of the 1978 Public Utility Regulatory Policy Act (PURPA) are considered. They are: When there is a need for additional generating capacity, is it cost-effective to: (1) use small unit sizes rather than fewer large units of similar total megawatt capacity, (2) use intermittent and unconventional generating units in place of some conventional units, (3) use generation in decentral rather than central applications. (ERA citation 10:022610)

536,096
DE85008882/GAR PC **A12/MF A01**
Boeing Aerospace Co., Seattle, WA. Energy Systems.
Small Central Receiver Brayton Cycle Study. Final Technical Report, December 1, 1982-June 30, 1983.
Jan 85, 271p SAND-84-8189
Contract AC04-76DR00789
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

The study was initiated to investigate the potential of small scale, central receiver Brayton cycle systems to provide simple, highly reliable, low-maintenance electrical generating systems. The objectives were to identify Brayton cycle configurations suited for high-reliability central receiver systems generating electricity in the 2- and 25-MW/sub e/ power ranges and to identify and recommend high-temperature receiver designs most appropriate to the preferred cycle configurations. The cycle configurations considered were open and closed cycles with and without regeneration and/or intercooling. The configurations were assessed in terms of required machine design modifications, component availability turbomachinery location, costs and performance. Design point performance was studied as a function of system pressure, turbine inlet temperature and receiver pressure loss. An open cycle regenerated and intercooled configuration was selected for the 25-MW/sub e/ plant size. At the 2-MW/sub e/ size, an open simple cycle was chosen. The high temperature receiver study involved the identification of heat exchange concepts, survey of high-temperature materials, and selection of preferred concepts. Thermal and mechanical design analyses were completed on the receiver concepts. The ceramic tube receiver concept was selected as the preferred concept for the 25-MW/sub e/ plant size. The small particle receiver concept was selected for the 2-MW/sub e/ plant size. The preferred receiver designs were combined with the preferred cycle data to produce system level designs. System performance and cost data were generated for each plant size. The results of this study show that small-scale, remotely-sited solar Brayton central receiver systems are technically feasible and economically attractive through the use of simple passive receiver designs and low-maintenance, high-reliability gas turbomachinery. (ERA citation 10:022580)

536,097
DE85009114/GAR PC **A12/MF A01**
Sandia National Labs., Livermore, CA.

Department of Energy Solar Central Receiver Annual Meeting: Proceedings.
Feb 85, 255p SAND-85-8202, CONF-8404139-
Contract AC04-76DR00789
Solar central receiver annual meeting, San Diego, CA, USA, 24 Apr 1984.
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

Separate abstracts were prepared for 24 papers in this proceedings. One other paper had been previously abstracted for EDB. (ERA citation 10:022561)

536,098
DE85009161/GAR PC **A04**/MF **A01**
Frostburg, MD.
Frostburg Hydropower Feasibility Study. Final Report.
Sep 82, 64p DOE/R3/08069-T1
Contract FG43-81R308069
Portions of this document are illegible in microfiche products.

The City of Frostburg obtains its water supply from two sources: an impounded reservoir on Piney Creek and a series of springs. Both sources are located on the other side of Big Savage Mountain from the City and the water treatment works. Water from both sources is pumped to the top of the mountain via two pipelines and then flows by gravity to the raw water storage reservoir and then to the water treatment plant. The purpose of this study is to assess the feasibility of recovering hydropower from the 0.85 MGD (1.3 cfs) average flow in the pipeline as it falls approximately 500 feet from the top of the mountain to the water treatment plant. Steps in this analysis have included field and laboratory testing of the pipeline for head loss and strength characteristics, discussions with the local electrical utility (The Potomac Edison Company) regarding technical interconnection requirements and purchase rates, and correspondence with several hydro-electric generation equipment manufacturers. (ERA citation 10:022510)

536,099
DE85009543/GAR PC **A06**/MF **A01**
Alphatech, Inc., Burlington, MA.
Power System Dispatcher Modeling in the Emergency State. Final Report.
E. E. Entin, K. R. Pattipati, M. G. Alexandridis, D. L. Kleinman, and J. C. Deckert. Jul 84, 124p DOE/RA/50276-T1
Contract AC01-80RA50276
Portions of this document are illegible in microfiche products.

A normative-descriptive model of a power system dispatcher's cognitive activities encompassing monitoring, short-term planning, and decision making during an emergency situation are described. Also reported are the details and results of a reasonableness assessment study of the dispatcher model. The normative-descriptive model is comprised of: (1) the mental model or internal view that a dispatcher holds of the power system; (2) display monitoring and attention allocation; (3) system cost; and (4) decision making. Human short-term memory capacity, serial processing, chunking, and one-step backtracking are explicitly represented. A set of eight fictional but realistic fault scenarios were developed depicting a loss of one or more transmission lines and/or prime generators. The scenarios were organized into a questionnaire and each scenario was accompanied by eight questions eliciting the respondents rating of various aspects of the dispatcher model's actions. Results show that the reasonableness questionnaire was highly reliable, actions of the dispatcher model were seen as at least moderately reasonable across scenarios, and in a final concensus half of all respondents rated the model's overall actions as at least moderately human operator-like. (ERA citation 10:022607)

536,100
DE85009807/GAR PC **A04**/MF **A01**
Argonne National Lab., IL.
Temperature Sensors for OTEC Applications.
L. Seren, C. B. Panchal, and D. M. Rote. May 84, 58p ANL/OTEC-PS-12
Contract W-31-109-ENG-38

Ocean thermal energy conversion (OTEC) applications require accurate measurement of temperatures in the 0 to 30 exp 0 C range. This report documents an experimental examination of commercially available quartz-crystal thermometers and thermistors. Three fixed-point baths were used for temperature measurements: the distilled-water/distilled-ice-water slurry, the triple-point-of-water cell, and the gallium melting-point cell. The temperature of carefully prepared ice-water slurries was verified routinely as 0.001 +- 0.003 exp 0 C. Quartz-crystal probes proved accurate to about 1 to 2 mK, with drift errors of the same order over a few days. Bead- and disk-type thermistor probes were found to be about equally stable with time in the 0 to 30 exp 0 C range. The overall probable error of using thermistors was found to be +-4 mK. A solid-block temperature bath suitable for on-site calibrations in OTEC work was used in the temperature-sweeping mode. Various polynomial fits were examined for the purpose of thermistor calibration; fits of order two and higher yielded about equally accurate calculated temperatures. (ERA citation 10:022566)

536,101
PB85-186211/GAR PC **A04**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Southwest Region Solar Pond Study for Three Sites: Tularosa Basin, Malaga Bend, and Canadian River,
W. J. Boegli, M. M. Dahl, and H. E. Remmers. Aug 84, 75p REC-ERC-83-17

In the study, the Bureau of Reclamation investigated the technical and economic feasibility of using solar salt-gradient ponds to generate power and to produce freshwater in Bureau projects at three sites--the Canadian River at Logan, New Mexico; Malaga Bend on the Pecos River near Carlsbad, New Mexico; and the Tularosa Basin in the vicinity of Alamogordo, New Mexico. The ponds would be used to generate electric power that could be integrated with the Bureau's power grid or used in combination with thermal energy from the ponds to power commercially available desalination systems to produce freshwater. Results of the economic analysis, which concentrated primarily on the Tularosa Basin site, showed that solar-pond-generated intermediate load power would cost between 62 and 90 mills/kWh and between 52 and 83 mills/kWh for baseload power. This results in benefit-cost ratios of approximately 2.0 and 1.3 for intermediate and baseload, respectively, when compared to similar facilities powered by fossil fuels. The cost savings are even more pronounced when comparing the two (solar versus fossil fuel) as a source of power for conventional distillation and membrane-type desalination systems.

536,102
PB85-186260/GAR PC **E04**/MF **E01**
Toshiba Corp., Tokyo (Japan).
Toshiba Review International Edition, Number 150, Winter 1984.
c1984, 54p
See also PB85-131415.Color illustrations reproduced in black and white.

Contents; TOSNIC 2000 series-uninterruptible power system using new GTOs; New static distance relay RYL1S for power transmission systems; AC electrification system for Roca line, Argentine Railways; Toshiba increased safety squirrel-cage induction motors certified by Australian standard; Highly reliable cellular mobile telephones; Integrated voice/data digital EPBX; New whole-body CT scanner, model TCT-70A; A 5,000-element CCD linear image sensor; Triple system (PAL/SECAM/NTSC) plus one VCR, Model V-53TR.

536,103
PB85-186666/GAR PC **A03**/MF **A01**
Martin Marietta Environmental Systems, Columbia, MD.
Effect of Biofouling on the Exclusion Efficiency of 2MM Wedge-Wire Screens,
S. B. Weisberg, W. H. Burton, and E. A. Ross. Nov 84, 33p PPSP/CP-84-2

The effect of biofouling on entrainment properties of wedge-wire screens was tested using a model intake facility with two side-by-side intake ports. Two 2mm slot-width screens were deployed; one was permitted to foul, the other was not. Entrainment rates of two ichthyoplankton species, naked gobies (Gobiosoma bosci) and bay anchovies (Anchoa mitchilli), were measured through both screens weekly for one month. The response of both species was similar. As fouling became more severe, entrainment rates through the fouled screen remained relatively constant compared to rates for the clean screen. The authors suggest that biofouling effectively reduced the slot size of the screen, causing greater physical exclusion of the smaller, naked gobies.

536,104
PB85-187201/GAR PC **A08**/MF **A01**
Agency for International Development, Washington, DC. Office of Evaluation.
Power to the People: Rural Electrification Sector.
Summary rept.,
G. Wasserman, and A. Davenport. Dec 83, 168p AID PROGRAM EVALUATION-11, AID-PN-AAL-027

Results of studies of the impact of rural electrification (RE) programs in Bolivia, Costa Rica, Ecuador, and the Philippines are summarized.

536,105
PB85-190015/GAR PC **E04**/MF **E04**
Centre de Documentation de l'Armement, Paris (France). Direction des Recherches, Etudes et Techniques.
Etude de Generation Electrique par Alternateur Grande Vitesse et Frequences Variables Regule a Frequence Fixe par Odduleur (Study of Electrical Generation through High-Speed and Variable Frequency Alternator Regulated to Fixed Frequency by Inverter),
A. L. Rolland. Jan 85, 47p
Text in French.

The knowledge gained by the Westinghouse Company in the sector of alternators, rectifiers, inverters is particularly felt in the following areas: Voltage quality (harmonics rate, level of continuous component) due to the control methods of the transistors and the filtering used. Power-to-weight ratio due to the development of a high-speed alternator, the assembly principle and methods of the inverter and the cooling methods applied. Performances, especially concerning paralleling, nuclear hardening, starter operation, system management, display. However, the chief evolution at Westinghouse is in the technology field since their new transistor constitutes a major advance for implementation of a cutting inverter in general. This technological advance will be even greater when their studies concerning advanced condensers will become known as anticipated within two years.

536,106
PB85-194884/GAR PC **A08**/MF **A01**
National Rural Electric Cooperative Association, Washington, DC.
Small-Scale Hydropower in Africa: Workshop Proceedings.
Mar 82, 170p AID-PN-AAN-406
Proceedings presented at Abidjan, Ivory Coast on March 1-5, 1982.

Included are: (1) three overviews of hydropower development in Africa; (2) five case studies (Ivory Coast, Ecuador, Pakistan, and Zaire); (3) seven papers on technical considerations (e.g., hydrologic, environmental, and geologic factors; data requirements; local manufacture of equipment; electronic load governors); (4) six papers on economic considerations (costs, financing, electricity tariffs, end use, and economic feasibility analysis); and (5) seven papers on institutional considerations (e.g., management operations, introducing hydropower to rural people, and legislative contributions to private sector hydropower development). Also provided is a summary of findings from conference participants' visit to a small hydro site at Aboisso, Ivory Coast.

536,107
PB85-209468/GAR
(Order as PB85-209443/GAR, PC **E05**/MF **E01**)
Mitsubishi Electric Corp., Tokyo (Japan).
Computer-Aided Engineering for Power-System Planning,
T. Tsuji, S. Watanabe, K. Ikeda, and A. Maeda.
c1985, 4p
Text in Japanese.
Included in Mitsubishi Denki Giho, v59 n2 p6-9 1985.

A computer-aided engineering (CAE) system has been developed to assist planning, design, and analysis of entire power-plant systems from the generator to the substations, as well as determining operation and maintenance procedures for the completed systems. The article describes how the integrated power-

system approach utilizes recent electronic advances to mechanize operations, automate equipment, and establish an advanced communication system. The technological fields required in the CAE system for power-system planning are discussed in detail and examples are given.

536,108
PB85-860906/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hydraulic Turbines for Electric Power Generation. 1973-May 1985 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for 1973-May 85.
Jun 85, 129p
Supersedes PB83-868091. Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the design and performance of water turbines for electric power generation. Among the topics discussed are fatigue testing and problems associated with water purity and corrosion, flow measurement criteria and methods, governing systems, and the efficiency of steam turbines. Francis and Kaplan turbines are prominently mentioned. (This updated bibliography contains 237 citations, 34 of which are new entries to the previous edition.)

10C. Energy Storage

536,109
AD-A153 965/9/GAR PC **A03**/MF **A01**
Woods Hole Oceanographic Institution, MA.
Low-Rate Discharge of Various Electrochemical Batteries for Use with Oceanographic Instruments.
Technical rept.,
A. J. Ciesluk, B. J. Guest, C. D. Marquette, and G. H. Tupper. Apr 85, 37p Rept no. WHOI-85-13
Contract N00014-76-C-0197

The endurance of self-sustained oceanographic instruments is generally limited to battery energy. Tests were initiated to measure the capacities of several types of electrochemical batteries when discharged at temperatures and rates typical of oceanographic use. Battery systems represented are alkaline-manganese dioxide, mercuric-oxide, and lithium-sulfur oxychloride. Results of tests completed so far are presented. A brief overview of those batteries best suited for use with self-sustained oceanographic instruments is included as an appendix.

536,110
DE85008482/GAR PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Additional Experiments Relative to the Shelf Life of Li(Si)/FeS sub 2 Thermal Batteries.
J. Q. Searcy, and J. R. Armijo. Feb 85, 25p SAND-84-1510
Contract AC04-76DP00789

Work described in this report is part of a continuing effort to develop a new thermal battery technology based on the Li(Si)/FeS sub 2 electrochemical couple. The results reported relate to the long shelf-life requirement for thermal batteries designed by Sandia, and include topics relevant to leakage through the hermetic seal and accelerated aging experiments with materials new to the technology. Conclusions relevant to leakage through the hermetic seal are that the maximum leak rate must not exceed 1.8 x 10 exp -7 w, where w is the grams of Li(Si) contained by a battery, and that a bomb-type leak test can be designed that is adequate for most Li(Si)/FeS sub 2 batteries. Conclusions relevant to long-term compatibility of new materials include the following: nickel is not compatible with the iron disulfide in the cathode; the CaSi sub 2 additive used to suppress the initial voltage transient does not react or degrade during accelerated aging experiments, but the use of that material can lead to an increase in the variability of the activated lives, especially for long-life batteries; Grafoil current collectors used with the cathode do not degrade in accelerated aging experiments. (ERA citation 10:022725)

536,111
PB85-192870/GAR PC **E07**/MF **E07**
Commission of the European Communities, Luxembourg.
Thermal Energy Storage System Using Organic Phase Change Materials with Improved Thermal Conductivity for Storage Temperatures between 35 and 120C,
G. J. van den Brink, and E. van Galen. c1984, 141p EUR-9260-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

This report describes the work carried out under contract number ESA-S-055-N(B) and for the 'Stichting Energieonderzoek Centrum Nederland' as part of the national research program on solar energy. In the research program it has been shown that the low thermal conductivity of the phase change material can be increased by using metal matrix structures. For many phase change materials the temperature dependent storage capacity has been measured by means of a DTA-apparatus. Some promising materials for both a low and a high temperature store have been found. Several prototype test units have been built and tested. It has been found that the metal matrix structures can be used as full scale storage devices. The stores of the heat exchanger/container type have shown to have a very high heat exchanger capacity rate and that they can be very good stratified. Calculations have been done for a combined space heating/cooling system for a dwelling.

11. MATERIALS

11A. Adhesives and Seals

536,112
PB85-861573/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mechanical Rotary Seals: Factors Affecting Surface Wear and Abrasion. 1973-May 1984 (Citations from FLUIDEX Data Base).
Rept. for 1973-May 84.
Jun 85, 240p

This bibliography contains citations concerning factors affecting mechanical rotary seals for rotating machinery. Topics include lubrication methods for the minimization of surface wear under abrasive conditions and effects of high temperature operations on leakage. Seals for both liquid and gaseous media are included. (This updated bibliography contains 333 citations, none of which are new entries to the previous edition.)

536,113
PB85-861581/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mechanical Rotary Seals: Factors Affecting Surface Wear and Abrasion. June 1984-May 1985 (Citations from FLUIDEX Data Base).
Rept. for Jun 84-May 85.
Jun 85, 34p
Supersedes PB84-865401.

This bibliography contains citations concerning factors affecting mechanical rotary seals for rotating machinery. Topics include lubrication methods for the minimization of surface wear under abrasive conditions and effects of high temperature operations on leakage. Seals for both liquid and gaseous media are included. (This updated bibliography contains 51 citations, all of which are new entries to the previous edition.)

536,114
PB85-861946/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hermetic Seals. 1972-June 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Jun 85.
Jun 85, 136p
Supersedes PB84-869007. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the design, manufacture, and applications of various types of hermetic seals. Teflon, sprayed ceramic, and radial face seals are considered. Special emphasis is placed on magnetic liquid seals. (This updated bibliography contains 164 citations, 10 of which are new entries to the previous edition.)

11B. Ceramics, Refractories, and Glasses

536,115
AD-A153 457/7 Not available NTIS
North Carolina State Univ., Raleigh. Dept. of Materials Engineering.
Kinetics and Mechanisms of High-Temperature Creep in Silicon Carbide. II. Chemically Vapor Deposited,
C. H. Carter, and R. F. Davis. Nov 84, 10p ARO-18434.2-MS
Presented at the Annual Meeting and Exposition (85th) of the American Ceramic Society Held at Chicago, IL on 26 Apr 83.
Availability: Pub. in Jnl. of the American Ceramic Society, v67 n11 p732-740 Nov 84 (No copies furnished by DTIC/NTIS).

Chemically vapor deposited (CVD) silicon carbide was subjected to constant compressive stresses (110 to 220 MN/sq m) at high temperatures (1848 to 2023 K) in order to determine the controlling steady-state creep mechanisms under these conditions. An extensive TEM study was also conducted to facilitate this determination. The strong preferred crystallographic orientation of this material causes the creep rate to be very dependent on specimen orientation. The stress exponent, n, in the equation epsilon alpha sigma was calculated to be 2.3 below 1923 K and 3.7 at 1923 K. The activation energy for steady-state creep was determined 175 to be + or - 5 kJ/mol throughout the temperature range employed. At temperatures between 1673 and 1873 K, the controlling creep mechanism for CVD SiC is dislocation glide, which is believed to be controlled by the Peierls stress, Although the activation energy does not change, the increase in the stress exponent for samples deformed at 1923 K suggests that the controlling creep mechanism becomes dislocation glide/climb controlled by climb.

536,116
AD-A153 784/4/GAR PC **A03**/MF **A01**
Spectran, Inc., Sturbridge, MA.
Preparation of Heavy Metal Fluoride Glasses in the Bulk Form.
Final rept. Oct 83-Jun 84,
P. Schultz, R. Beni, and R. Kirk. Jan 85, 46p RADC-TR-84-279
Contract F30602-83-C-0189

A controlled atmosphere glass melting facility has been designed and built at SpecTran. A program has been established to developing a reproducible process for the preparation of high purity, fluoride glasses in the bulk form. A dry-box (approx. 10 ppm H_2O) has been installed. In addition, a melting furnace has been designed and built. The glasses have been melted under a dry, inert atmosphere, either nitrogen or argon. Both vitreous carbon and platinum crucibles have been used. A black phase has occurred in ten of the first twelve melts. Scanning Electron Microscopy and Energy Dispersive X-Ray Spectroscopy, as well as remelting in CC14 have been used to identify the black phase. It has been determined that water and oxygen have leaked into the melting atmosphere and caused cation reduction. With improved furnace seals, five clear melts have resulted. The inert atmosphere process which has been established appears promising, and should be further developed.

536,117
PB85-195592/GAR PC **E03**/MF **E01**

Hebrew Univ., Jerusalem (Israel).
Development of Planar Fluorescent Concentrators for Photovoltaic Systems.
Rept. for 1 Oct 81-30 Jan 82,
R. Reisfeld. 1982, 23p
Sponsored by Department of Energy, Washington, DC., and Ministry of Energy and Infrastructure, Tel Aviv (Israel).

New multicomponent glasses were prepared. Inorganic ions like Mn(+2), Cr(+3), and UO2(+2) of different concentrations were introduced into the glasses. Optical properties such as absorption, emission and excitation spectra were measured.

536,118
PB85-861763/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Piezoelectric Ceramics. July 1983-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for Jul 83-Jun 85.
Jun 85, 125p
Supersedes PB84-867084.

This bibliography contains citations concerning properties and applications of piezoelectric ceramics. Structural, dielectric, electromechanical, and dilational properties are discussed. Design and analysis techniques of piezoceramic devices are considered. (This updated bibliography contains 137 citations, 67 of which are new entries to the previous edition.)

11C. Coating, Colorants, and Finishes

536,119
NUREG/CR-3803/GAR PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Effects of Post-LOCA (Loss-of-Coolant-Accident) Conditions on a Protective Coating (Paint) for the Nuclear Power Industry.
Rept. for Jan 82-Sep 83,
V. M. Loyola, and J. E. Womelsduff. Mar 85, 40p
SAND-84-0806
Contract DE-AC04-76DP00789

The oxidation of zinc in a zinc-rich coating used in the nuclear power industry has been studied and the rates of hydrogen generation from these coatings due to zinc oxidation at temperatures of up to 175 degrees C has been measured. The results suggest that the real-time rates of hydrogen generation are considerably higher than previously believed. The higher rates measured in this study are probably due to differences in experimental methodologies between this and previous studies. In this study, the measurements were real-time measurements, as opposed to time-averaged values which are typically obtained. The results suggest, as have the results of other investigators, that the measured rates and reaction parameters may not be those of any specific reaction, but are instead the 'effective' values of a series of complex systems operating together. However, the total quantity of hydrogen generated by this mechanism is significantly less than can be produced from other sources, e.g., steam: zirconium.

536,120
PB85-176812/GAR PC **A06**/MF **A01**
California State Dept. of Transportation, Sacramento. Office of Transportation Lab.
Investigate Alternatives for Solvent-Borne Traffic Paint.
Interim rept. 1979-82,
D. R. Chatto, and T. L. Shelly. Jan 83, 124p TL-604187, FHWA-83/03

Restrictions on the amount of volatile organic compounds emitted into the atmosphere during traffic striping operations have been drastically increased by the proposed rulings of the California Air Resources Board. To comply with these regulations, alternative materials for road delineation had to be investigated. These alternatives include water-borne paint and high solids coatings. Work on the water-borne traffic paint was terminated before the final evaluation was made and research efforts were directed toward the high solids coatings. Final evaluation on the high solids coatings and any further work done on water-borne traffic paint will be reported at a later date.

536,121
PB85-861458/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Protective Coating Methods and Compositions. 1970-June 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-Jun 85.
Jun 85, 90p

This bibliography contains citations of selected patents concerning compositions, and methods of applying protective coatings on metal, plastic, glass, and wood substrates. Descriptions of composite materials that are resistant to corrosion, heat, wear, and weathering are discussed. Coating techniques employed in semiconductor and optical device fabrication, and industrial equipment finishing are reviewed. (Contains 110 citations fully indexed and including a title list.)

536,122
PB85-861482/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Corrosion Resistant Coatings. June 1983-May 1985 (Citations from the Engineering Index Data Base).
Rept. for Jun 83-May 85.
Jun 85, 69p
Supersedes PB84-864768.

This bibliography contains citations concerning anticorrosive behavior of protective coatings based on such materials as ceramics, metals and polymers. High and low temperature corrosion, surface structure, mechanical and chemical properties, applications and performance evaluations are among the topics discussed. Paints and powder coatings, and methods of application are also considered. (This updated bibliography contains 87 citations, 35 of which are new entries to the previous edition.)

536,123
PB85-861490/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plastic Electrostatic Coatings. 1973-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Jun 85.
Jun 85, 109p
Supersedes PB84-864271.

This bibliography contains citations concerning developments, formulations, utilization, and performance of polymeric electrostatic coatings. Methods of application such as dipping, spraying, clouding and flame spraying are discussed. Powder coatings from nylons, epoxides, polyvinyl chlorides, polyethylenes, polyesters, polycarbonates and polysulfones are among the materials examined. (This updated bibliography contains 168 citations, 27 of which are new entries to the previous edition.)

536,124
PB85-861680/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sputter Coating of Tantalum and Tantalum Compounds. 1976-May 1985 (Citations from the Energy Data Base).
Rept. for 1976-May 85.
Jun 85, 133p
Supersedes PB84-869015. Prepared in cooperation with Department of Energy, Washington, DC.

This bibliography contains citations concerning the properties of tantalum and tantalum compound films formed by sputtering techniques. Various techniques are examined and include ion beam, reactive, and radio frequency sputtering. The electrical, magnetic, and dielectric properties of the tantalum thin films are discussed. Tantalum compounds studied include nitrates, oxides, and aluminides. The structural properties of tantalum sputtered films are also presented. (This updated bibliography contains 152 citations, 28 of which are new entries to the previous edition.)

536,125
PB85-861813/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plasma and Flame Sprayed Coatings. 1970-June 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-Jun 85.
Jun 85, 199p

This bibliography contains citations of selected patents concerning devices and processes employed in the application of plasma and flame sprayed coatings on industrial products and equipment. Metallic and ceramic materials used in heat, abrasion, corrosion, and radiation resistant coatings are analyzed. Sprayed coatings used for turbine engine sealing and shroud restoring, and antireflectory coatings on solar cells are also discussed. (Contains 275 citations fully indexed and including a title list.)

11D. Composite Materials

536,126
AD-A153 466/8/GAR PC **A05**/MF **A01**
Utah Univ., Salt Lake City. Dept. of Civil Engineering.
Fatigue Behavior of Unidirectional Fp-Al Composites with Circular Holes.
Final rept. 21 Jul 80-20 Jul 83,
G. J. Dvorak. Nov 84, 90p AMMRC-TR-84-44, SBI-F870 002
Contract DAAG46-80-C-0059

This investigation examines the response of the FP-AL system under both tensile and compressive cyclic loads, and also in the presence of circular holes. A related analysis of elastic-plastic deformation of the specimens under cyclic loading has been performed and used in interpretation of the experimental data. Of particular interest here was an examination of the relationship between shakedown and onset of fatigue damage in the aluminum matrix. Magnitudes of fiber stress in the vicinity of the circular holes under cyclic loading were evaluated as well. The fatigue damage modes, under various loading conditions were also examined. This report describes the experimental program, its results, the plasticity analysis of test specimens, and interpretation of the experimental data.

536,127
AD-A153 494/0/GAR PC **A05**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
Effect of Center Delamination on the Instability of Composite Cylindrical Panels.
Master's thesis,
G. R. Seifert. Dec 84, 83p Rept no. AFIT/GAE/AA/84D-25

The buckling loads of 8-ply graphite-epoxy delaminated cylindrical panels were determined experimentally. The analysis included two different ply orientations, two different aspect ratios (length/chord), two different delamination sizes, and one set of boundary conditions; clamped along the top and bottom edges and simply supported along the vertical sides. The experimental test results were compared to the linear bifurcation loads obtained from the STAGSC-1 finite element computer code and the buckling loads of panels with square cutouts which were also obtained from STAGSC-1. The experimental testing was accomplished by the Air Force Flight Dynamics Laboratory. Experimental difficulties were encountered due to the inability of the test apparatus to evenly distribute the load through the simply supported boundary conditions. The uneven load distribution resulted in nonsymmetric buckling patterns, however, the buckling loads showed good correlation between analytical and experimental values. All experimental buckling loads were less than the analytical value predicted by STAGSC-1. The amount of decrease in load depended on ply orientation, aspect ratio, and delamination size. (Author)

536,128
AD-A153 929/5/GAR PC **A02**/MF **A01**
Princeton Univ., NJ. Dept. of Chemical Engineering.
Structure-Property Relationships in Polymeric Matrix Materials.
Final technical rept. 1 Aug 75-31 Jan 84,
J. K. Gillham. 15 Apr 85, 14p Rept no. TR-27
Contract N00014-76-C-0200

The main results of the research program are summarized in terms of: (I) development of a time-tempera-

ture-transformation (TTT) cure diagram for thermosetting systems; (II) automation of a torsion pendulum using digital computers; (III) characterization of novel polymers, composites and transitions, and (IV) development and application of a pyrolysis system for characterizing the thermal degradation mechanisms of polymers.

536,129

PB85-862308/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Carbon Fiber Reinforced Plastics (Nongraphite): Properties and Tests. 1973-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Jun 85.
Jun 85, 128p
Supersedes PB84-869072.

This bibliography contains citations concerning mechanical, thermal and electrical properties and testing techniques of carbon fiber reinforced plastics (CFRP) excluding applications. Stress strain properties, tensile and shear strength, fracture toughness and thermal performance of CFRP are tested and evaluated. Topics discussed include environmental degradation, fatigue behavior and nondestructive testing methods of CFRP. (This updated bibliography contains 178 citations, 27 of which are new entries to the previous edition.)

536,130

PB85-862340/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Carbon Fiber Reinforced Plastics (Nongraphite): Non-Aerospace Applications. 1973-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Jun 85.
Jun 85, 101p
Supersedes PB84-868959.

This bibliography contains citations concerning non-aerospace applications of carbon fiber reinforced plastics (CFRP). Among the applications considered are automotive, medical, surgical, and sports equipment. The uses of CFRP for light weight, high strength materials, and environmental considerations in non-aerospace applications are included. (This updated bibliography contains 149 citations, 45 of which are new entries to the previous edition.)

11F. Metallurgy and Metallography

536,131

AD-A153 640/8/GAR PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Rolling Contact Fatigue Testing of Thermomechanically Processed M-50 Steel.
Master's thesis,
F. A. Butterfield. Dec 84, 104p

The influence on rolling contact fatigue behavior of thermomechanical processing (TMP) to refine grain and soluble carbide size was studied in this work on VIM-VAR M-50 steel. Material was processed (austenitized and warm-rolled) following the procedures developed by Larson, with subsequent austenitization times and temperature (for final hardening) based on Bres' data. Rolling contact fatigue testing indicates virtual equivalence of the as-received (spheroidize-annealed) and TMP specimens evaluated, with the TMP material clearly no better than the as-received condition in terms of fatigue life. This is believed to be the result of one or both of the following: (a) austenitization (hardening) of TMP material at too long a holding time, with a microstructural equalization occuring between conditions; and (b) voids existing at the ends of insoluble carbides in both as-received and TMP material, which act as possible sites for crack initiation in the matrix.

536,132

AD-A153 713/3/GAR PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Creep and Fatigue Crack Growth in Several Cast Superalloys,
P. Shahinian, and K. Sadananda. 1984, 11p
Pub. in Proceedings of the International Symposium on Superalloys (5th) Held at Champion, PA., on 7-11 Oct 84.

Crack growth behavior in two cast nickel-base alloys, IN-713LC and IN-100, and a cobalt-base alloy, MAR-M509, under cyclic, static, and combined loads has been investigated at 927 C (1700 F) in air and in vacuum. The three alloys exhibited similar behavior in many respects. Fatigue crack growth rates generally were higher in air than in vacuum and also were raised by including a hold period at peak load. Two of the alloys at low stress intensities exhibited crack retardation and arrest. Most important, in vacuum the fatigue crack growth rates of the three alloys were essentially the same for a given Delta K. Contrary to the environmental effect in fatigue, crack growth rate for static loads was lower in air than in vacuum. Also unlike in fatigue the creep crack growth rates in vacuum differed significantly among the three alloys. Thus creep crack growth was sensitive to microstructure whereas fatigue crack growth was not, excluding environmental effects. J-integral correlation with fatigue crack growth rates was comparable to the Delta K correlation.

536,133

AD-A153 843/8/GAR PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Marine Corrosion.
Final rept.,
A. J. Sedriks. 24 Apr 85, 25p Rept no. NRL-MR-5527

This report is a review of marine corrosion of metals and alloys which is to be included in the new Handbook of Ocean Engineering, to be published by Academic Press in 1985. The report describes marine environments, the types of marine corrosion encountered, cathodic protection and alloys used in marine applications. Emphasis is placed on describing the types of corrosion generally found and the preventative measures employed.

536,134

AD-A153 886/7/GAR PC **A03**/MF **A01**
Naval Air Development Center, Warminster, PA. Aircraft and Crew Systems Technology Directorate.
Corrosion Fatigue Cooperative Testing Program Statistical Analysis.
Final rept.,
M. T. Russo. 26 Oct 84, 45p Rept no. NADC-84078-60

Corrosion fatigue tests were conducted on aluminum alloy specimens for the AGARD-Coordinated Corrosion Fatigue Cooperative Testing Program by nine different laboratories. A statistical analysis of the resulting experimental data was performed to establish whether fatigue test results were reproducible from one laboratory to another and to examine the effect of environmental condition on fatigue life. Three different statistical methods were applied to the data, one of which involved using a computer program. The analysis showed that there are several significant inter-laboratory differences and that environmental condition affects life, significantly and consistently, and the origin of fatigue in specimens. (Author)

536,135

AD-A153 913/9/GAR PC **A03**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Study of the Influence of Metallurgical Factors on Fatigue and Fracture of Aerospace Structural Materials.
Annual Scientific rept.,
J. Lankford, D. L. Davidson, G. R. Leverant, and K. S. Chan. Feb 85, 48p SwRI-7436, AFOSR-TR-85-0372
Contract F49620-83-C-0054

This report summarizes the results of a study involving: (1) experimental characterization and analytical modeling of fatigue crack tip micromechanics in aerospace structural (aluminum and titanium) alloys; and (2) identifying and modeling key factors controlling subcritical crack growth and unstable fracture in single crystal nickel-base superalloys. The first section summarizes studies in which mesured crack tip parameters and microstructural characterization are incorporated into a recently developed crack tip geometric model which interrelat4es microstructure with fatigue crack growth. The model is used with 7075-T651 Al, 7091 P/M Al, and Ti-6Al-4V to predict crack growth increments (striation spacings), which are then compared with experimental measurements for the Al alloys. Additional crack tip characterization was performed on an experimental high temperature aluminum alloy (HTAL). By using a recently developed SEM high temperature cycling stage, crack tip yielding and extension was characterized at 315 C, which showed that the interfaces of certain microstuctural elements unique to the HTAL alloy were detrimental to its resistance to elevated temperature fatigue crack growth. The second section describes results of ambient temperature crack growth tests of single crystal Mar-M200. Tests were carried out as functions of stress intensity range, normal stress to shear stress ratio, and crystallographic orientation, and their efect on mode of cracking and crack growth characteristics was established.

536,136

AD-A153 925/3 Not available NTIS
Naval Research Lab., Washington, DC.
Crack Propagation under Creep and Fatigue,
K. Sadananda. 1984, 22p
Availability: Pub. in Nuclear Engineering and Design, v83 n3 p303-323, 2 Dec 84 (No copies furnished by DTIC/NTIS).

Crack growth under cyclic, static and combined loads in several high temperature alloys is presented from both material and fracture mechanics aspects. Parametric representation of high temperature crack growth in terms of linear and non-linear fracture mechanics is discussed along with the experimental determination of these parameters for several specimen geometries. Crack growth is characterized as cycle-dependent, time-dependent or combined cycle- and time-dependent processes depending on material, temperature, load frequency and environment. While the cycle dependent process is due to fatigue damage, the time-dependent process could be due to creep or environmental effects or both. It is shown that the applicability of a particular fracture mechanics parameter to characterize high temperature crack growth depends on micromechanics of the growth.

536,137

DE85008257/GAR PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Strain Fields for Aluminum at Different Tooling Temperatures and Extrusion Ratios.
H. B. Peacock, and D. G. Berghaus. Mar 85, 21p DP-MS-85-10, CONF-850499-1
Contract AC09-76SR00001
Conference on advances in the production of tubes, bars and shapes, Cincinnati, OH, USA, 22 Apr 1985. Portions of this document are illegible in microfiche products.

Strain distributions throughout the die region are obtained for axisymmetric extrusion of aluminum billets. Results which include the three extensional strains and accumulated shear are produced from an analysis of experimentally obtained laminar flow lines on extruded specimens. Extrusion experiments are performed at average tooling temperatures of 174 exp 0 C and 354 exp 0 C and for extrusion ratios from 1.9 to 12.4. Both tooling temperatures and extrusion ratios affect the magnitude and/or the distribution of plastic strains in extruded aluminum. (ERA citation 10:022839)

536,138

DE85008758/GAR PC **A09**/MF **A01**
Oak Ridge National Lab., TN.
Fossil Energy Materials Program Implementation Plan for Fiscal Years 1985 Through 1989.
R. A. Bradley, and P. T. Carlson. Feb 85, 176p
ORNL/TM-9328
Contract AC05-84OR21400

This program implementation plan for the Department of Energy Advanced Research and Technology Development (AR and TD) Fossil Energy Materials Program reviews the background, technical issues, and research and development needs for materials of construction for fossil energy systems. The status and plans for research and development activities in the AR and TD Fossil Energy Materials Program are then discussed for various materials disciplines. Detailed information about these plans is provided for FY 1985 through FY 1987, and long-range plans are described for FY 1988 and FY 1989. In addition to descriptions of planned research activities, this plan provides levels of

effort required for the various activities. (ERA citation 10:019660)

536,139
DE85008895/GAR PC **A02**/MF **A01**
North Carolina State Univ. at Raleigh. Dept. of Materials Engineering.
Erosion of Multiphase Materials.
K. Anand, C. Morrison, R. O. Scattergood, H. Conrad, and J. L. Routbort. 1984, 24p CONF-8409117-1
Contract FG05-84ER45115
International conference on the science of hard materials, Rhodes, Greece, 23 Sep 1984.

Erosion rate measurements were made for a series of WC-Co alloys with varying WC-Co grain size and for a fully aligned composite consisting of Al sub 2 O sub 3 rods in a stainless steel matrix. The microstructure in these multiphase alloys, each containing a brittle and ductile component, has a significant effect on the erosion behavior. In WC-Co alloys, the erosion rate vs angle-of-incidence curves change from a brittle to a ductile signature as the impacting abrasive particle size or particle velocity are increased using target samples with finer WC grain sizes. In the composite, the curves change from a ductile to a brittle signature as the particle size is increased. These effects are attributed to the change in scale of the impact damage event relative to the scale of the microstructure in WC-Co alloys. At small WC grain size, a constraint is imposed on the brittle-fracture erosion process that occurs in the WC grains. For the composite, the microstructural scale is always large and the behavior is due to the relative change in erosion rates for the two components without constraints due to the microstructural scale. (ERA citation 10:022889)

536,140
DE85009418/GAR MF **A01**
Minnesota Univ., Minneapolis. Corrosion Research Center
Corrosion Research Center of the University of Minnesota Progress Report, January 1-December 31, 1984.
R. A. Oriani. Feb 85, 219p DOE/ER/45173-1
Contract FG02-84ER45173
Microfiche only, copy does not permit paper copy reproduction.

The research is reported in two parts: (1) surface structures and reactions in aqueous corrosion systems, and (2) role of oxide scale morphology and structure on high temperature oxidation and corrosion processes. (ERA citation 10:022838)

536,141
DE85009779/GAR PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Interfacial Segregation and Fracture.
M. H. Yoo, C. L. White, and H. Trinkaus. Mar 85, 55p ORNL/TM-9016
Contract AC05-84OR21400

A brief review is given of the physical mechanisms that control nucleation, growth, and coalescence of intergranular cavities during deformation of polycrystalline materials at intermediate temperatures under low applied stress. The effects of interfacial solute segregation on creep ductility are discussed in terms of its effects on interfacial energies and diffusivities. The available experimental dta on detrimental and beneficial solute effects on creep rupture life of model alloy systems are consistent with the calculated time to rupture. Our limited understanding of the grain-boundary chemistry effects on creep embrittlement of commercial structural alloys is preseted, and further experimental and theoretical studies for the better understanding of controlling mechanisms are suggested. 107 references, 19 figures. (ERA citation 10:022846)

536,142
DE85009848/GAR PC **A02**/MF **A01**
Bendix Corp., Kansas City, MO.
Aging Study of Copper Alloy 172. Final Report.
M. G. Ulitchny. Apr 85, 13p BDX-613-3227
Contract AC04-76DP00613

An evaluation of the effects of aging temperature on the yield strength and toughness of beryllium-copper alloy 172 shows that all the toughness measurements, impact energy, pre-cracked Charpy, and compact tension parallel each other and mirror the tensile strength. An aging schedule which is improved from that currently prescribed has been determined in order to produce an improved combination of strength-toughness. A study of the surface wave velocity as a function of aging temperature has revealed an easy way to determine under-aging or over-aging in this alloy. (ERA citation 10:022831)

536,143
DE85700444/GAR PC **A04**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
Metallurgy Department Progress Report for the Period 1 January to 31 December 1983.
Jun 84, 72p RISO-R-503
U.S. Sales Only.

The activities of the Metallurgy Department at Risoe during 1983 are described. The work is presented in three chapters: General Materials Research, Technology and Materials Development, and Fuel Elements. Furthermore, a survey is given of the Department's participation in international collaboration and of its activities within education and training. A list (with abstracts) of publications and lectures by the staff during 1983 is included. (Atomindex citation 16:003617)

536,144
PB85-185312/GAR PC **A02**/MF **A01**
Bureau of Mines, Reno, NV. Reno Research Center.
Production of High-Purity Gold from Zinc Precipitates and Steel Wool Cathodes by Hydrometallurgical Refining.
Information circular/1985,
G. E. McClelland, M. D. Wroblewski, and J. A. Eisele. 1985, 18p BUMINES-IC-9002
Library of Congress catalog card no. 84-600263.

The Bureau of Mines investigated chemical methods for producing high-purity gold from precious-metal-bearing zinc precipitates and steel wool cathodes. Precious-metal-bearing zinc precipitates and steel wool cathodes are unrefined products from conventional cyanidation and heap leaching-cyanidation operations. The zinc precipitates contained 14.40 pct Au and 0.35 pct Ag. The precious-metal-bearing steel wool cathodes contained 20.65 pct Au and 4.84 pct Ag. The precipitates and cathodes were treated with dilute acid to solubilize the silver and/or base metals. The gold-bearing residue was leached in dilute aqua regia to solubilize the gold. High-purity gold was precipitated from the aqua regia solution with oxalic acid, sulfurous acid, sodium bisulfite, and gaseous sulfur dioxide. The leaching-precipitation experiments recovered 99.9 pct of the gold. The gold precipitates ranged in fineness from 997 to 999 fine. The chemical refining method provides a viable technique for the smaller operator to produce high-purity gold without using pyrometallurgical refining methods.

536,145
PB85-185361/GAR PC **A02**/MF **A01**
Bureau of Mines, Washington, DC.
Laboratory Processing and Characterization of Waste Materials from Manganese Nodules.
Rept. of investigations/1985,
B. W. Haynes, D. C. Barron, G. W. Kramer, R. Maeda, and M. J. Magyar. 1985, 23p BUMINES-RI-8938
Prepared in cooperation with National Oceanic and Atmospheric Administration, Washington, DC. Libary of Congress catalog card no. 84-600296.

The Bureau of Mines report describes the laboratory processing of manganese nodules and the results of tailings characterization obtained during the cooperative program with the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) and the Bureau. Five technically feasible first-generation nodule processing methods were operated at bench scale to generate sufficient tailings and slags for physical and chemical analyses. A description is given for the laboratory operation of the individual unit operations of each process. The laboratory-generated tailings and slags were tested for physical properties, mineral content, elemental and ion content, and leachability for all five processes. The results of leachate testing using the Environmental Protection Agency extraction procedure (EP) toxicity test, the American Society for Testing and Materials shake extraction test, and the EPA-U.S. Army Corps of Engineers seawater elutriant test showed very low to negligible leaching of metals from the tailings and slags. Results of the EP toxicity test demonstrated that the wastes are nonhazardous as defined in the Resource Conservation and Recovery Act (Public Law 94-580).

536,146
PB85-185635/GAR PC **E03**/MF **E03**
Electricity Council Research Centre, Capenhurst (England).
Loop-Heated Ladle for Holding Molten Metal,
P. J. Hayes, J. F. Tremayne, M. C. Perks, and R. B. Parish. Apr 84, 16p ECRC/R1796

A brief description of a loop-heated ladle installation at Midland Rollmakers Limited, Crewe, is presented. The plant consists of a 20 ton nominal capacity bottom-poured ladle fitted with an induction heated loop. It operates with a maximum power-rating of 800 kW and has increased the foundry steel-casting capacity from 30 to 50 tons in order to supply an important sector of the steel-roll market. Production runs are described which show the plant to be capable of holding and superheating both iron and steel in the temperature range 1500-1640C. This gives sufficient time for the primary melting furnaces to produce the balance of metal necessary to meet the required casting weight. The unit also demonstrates how the simple geometry of the ladle and loop combined with high-quality refractories allows intermittent use to comply with production demands. Aspects of engineering design and safety are also discussed, together with suggestions for other uses of the loop-heated ladle system.

536,147
PB85-187383 Not available NTIS
National Bureau of Standards, Boulder, CO. Fracture and Deformation Div.
Elastic-Constant Anomalies at the Neel Transition in Fe-18Cr-3Ni-12Mn.
Final rept.,
H. M. Ledbetter, and E. W. Collings. 1985, 5p
Sponsored by Defense Department, Canberra (Australia).
Pub. in Materials Science and Engineering 68, p233-237 1985.

The elastic constants of an 18Cr-3Ni-12Mn austenitic stainless steel (where the steel composition is given in approximate weight per cent) were measured ultrasonically between room temperature and liquid helium temperature. All the elastic constants change anomalously and reversibly near 191 K, which magnetic susceptibility measurements show to be the Neel (paramagnetic-to-antiferromagnetic) transition temperature.

536,148
PB85-188936/GAR PC **A03**/MF **A01**
Aerocomp, Inc., Costa Mesa, CA.
Corrosion Rates of Galvanized Chain-Link Fence: A Field Study,
S. B. Cunningham, T. Chico, and F. H. Haynie. 1985, 27p EPA/600/D-85/060
Contract EPA-68-02-4039

Research was performed to establish the rate of corrosion of the zinc coating on highway chain-link fence in four cities around the country. Samples of fence were collected at two kilometer intervals along highways in Philadelphia, Denver, Hartford, and Houston. The cities represented a variety of climatological types and air pollution levels. At the 40 sampling sites in each city the age and original coating specifications were obtained as was information on present and historical levels of sulfur dioxide. Based on results of chemical analysis of the samples, the average corrosion rate within and among cities was determined.

536,149
PB85-862076/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aluminum Castings. 1970-June 1984 (Citations from the Engineering Index Data Base).
Rept. for 1970-Jun 84.
Jun 85, 229p

This bibliography contains citations concerning casting of aluminum and aluminum alloys. Included are citations on molds, pouring temperature, furnaces, and metallurgical influences of inclusions and alloying. Many citations pertain to the properties of aluminum castings, such as tensile strength, shrinkage, porosity, ductility, and machinability. A few citations relate to applications of such castings, including structural forms, structural frames, wheels, and engines. (This updated bibliography contains 356 citations, none of which are new entries to the previous edition.)

536,150
PB85-862084/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Aluminum Castings. July 1984-June 1985 (Citations from the Engineering Index Data Base).
Rept. for Jul 84-Jun 85.
Jun 85, 44p
Supersedes PB84-869338.

This bibliography contains citations concerning casting of aluminum and aluminum alloys. Included are citations on molds, pouring temperature, furnaces, and metallurgical influences of inclusions and alloying. Many citations pertain to the properties of aluminum castings, such as tensile strength, shrinkage, porosity, ductility, and machinability. A few citations relate to applications of such castings, including structural forms, structural frames, wheels, and engines. (This updated bibliography contains 54 citations, all of which are new entries to the previous edition.)

536,151
PB85-862175/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Magnesium Alloys: Corrosion Properties. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 111p
Supersedes PB84-866045.

This bibliography contains citations concerning the corrosion of a variety of magnesium-containing alloys. Stress corrosion, metal fatigue, and hydrogen embrittlement studies of aircraft structural components and reactor materials are among the topics discussed. Considerable attention is given to alloys of aluminum and magnesium. (This updated bibliography contains 118 citations, 34 of which are new entries to the previous edition.)

536,152
PB85-862274/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Amorphous Alloys: Magnetic Films. 1971-June 1985 (Citations from the Metals Abstracts Data Base).
Rept. for 1971-Jun 85.
Jun 85, 90p
Supersedes PB84-867654.

This bibliography contains citations concerning magnetic amorphous alloy films. Magnetic properties, additive and impurity effects, domain structure, thermal stability, and sputtering techniques of amorphous alloy films are discussed. Properties of cobalt base alloys and ferrous alloys related to magnetic films are presented. (This updated bibliography contains 127 citations, 11 of which are new entries to the previous edition.)

11I. Plastics

536,153
AD-A153 414/8 Not available NTIS
McGill Univ., Montreal (Quebec). Dept. of Chemistry.
Miscibility of Poly(vinyl Chloride) with Ethyl Acrylate 4-Vinyl Pyridine Copolymers.
S. D. Clas, and A. Eisenberg. 1984, 12p ARO-20674.8-CH
Contract DAAG29-83-K-0140
Availability: Pub. in Jnl. of Polymer Science, v22 p1529-1539 1984 (No copies furnished by DTIC/NTIS).

Blends (50:50,w:w) of poly(vinyl chloride) (PVC) and poly(ethyl acrylate-co-4-vinyl pyridine) (PEA-4-VP) of different 4-VP contents (2-14 mol %) were prepared. These new found to be partially miscible as evidenced by the presence of a single, though broad, tangent delta peak obtained from torsion pendulum experiments. Several possible types of interactions which might exist between PVC and PEA-4-VP, such as ion-dipole, crosslinking, charge transfer, hydrogen bonding, and dipole-dipole interactions, were explored. From ultraviolet, conductance, infrared, and solubility studies, it was shown that hydrogen bonding or dipole-dipole (or possibly a combination of the two) interactions were the most likely in this system. These interactions have been suggested previously for other systems by various investigators.

536,154
AD-A153 674/7 Not available NTIS
McGill Univ., Montreal (Quebec). Dept. of Chemistry.
Miscibility Enhancement via Ion-Dipole Interactions. 1. Polystyrene Ionomer/Poly(alkylene oxide) Systems.
M. Hara, and A. Eisenberg. 1984, 7p ARO-17438.9-CH
Contract DAAG29-80-C-0144
Availability: Pub. in Macromolecules, v17 p1335-1340 1984 (No copies furnished by DTIC/NTIS).

It is shown that ion-dipole interactions can lead t miscibility enhancement in polymer blends. While polystyrene is not miscible with poly(ethylene oxide) or poly(propylene oxide), styrene ionomers show very high miscibility with these materials at low alkylene oxide contents (10 wt %) and high, though not complete, miscibility at higher loading levels. For these systems it is seen that the glass transition temperature (from G" peak positions) of the styrene ionomer is depressed dramatically with increasing alkylene oxide contents and that the glass transition of the alkylene oxide rises appreciably (in most cases) with increasing styrene ionomer content. Increases in ion content at constant styrene levels increase the miscibility. The degree of miscibility enhancement is comparable to that achieved in hydrogen-bonded system. Finally, molecular weight effects observed here are quite similar to those seen in other blend systems.

536,155
AD-A153 856/0/GAR PC A02/MF A01
Army Test and Evaluation Command, Aberdeen Proving Ground, MD.
Chemical Compatibility of Nonmetallic Materials.
Final rept. on test operations procedure.
23 Apr 85, 15p Rept no. TOP-3-2-609

This TOP(Test Operations Procedure) provides procedures for evaluating the cemical compatibility of the nonmetallic materials, by immersion in various chemicals. Physical properties of the material to be tested are measured before and after immersion to determine the degradation attributable to the immersion chemical. The chemicals used for the immersion check are predominantly found in the military training and combat environment. Tests include: Chemical Compatability Test of Nonmetallic Material (Plastic) Used to Construct Weapons System, Chemical Compatibility Test of Nonmetallic Materials (Plastic) Used to Construct Ammunition; Chemical Compatability Test of Nonmetallic Materials (Plastic) Used to Construct Other Items (excluding ammunition and weapons).

536,156
PB85-187367 Not available NTIS
National Bureau of Standards (NEL), Boulder, CO. Chemical Engineering Science Div.
Thermal and Mechanical Properties of Polyurethane Foams at Cryogenic Temperatures.
Final rept.,
L. L. Sparks, and J. M. Arvidson. 1984, 14p
Sponsored by Gas Research Inst., Chicago, IL.
Pub. in Proceedings of Society of the Plastics Industry (SPI) 28th Annual Technical/Marketing Conference, San Antonio, TX, November 5-7, 1984, p273-286.

Expanded plastics are used extensively for thermal insulation in cryogenic fuel facilities. Properties determined were thermal conductivity, thermal expansion, strength and moduli in compression and in tension, proportional limit, yield strength, ultimate strength, and shear strength. Physical properties were determined both parallel and perpendicular to the direction of foam rise. The gas content of the specimens was determined using a gas chromatograph-mass spectrometer, and the cell morphology was studied optically. Empirical procedures for estimating the temperature dependent thermophysical properties are discussed. These procedures utilize the characterization parameters for molar gas concentration and cell morphology.

536,157
PB85-861508/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Injection Molding of Polypropylenes. July 1982-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for Jul 82-Jun 85.
Jun 85, 119p
Supersedes PB84-863703.

This bibliography contains citations concerning injection molding of reinforced and non-reinforced polypropylene resins. Equipment expense, operation, maintenance and design developments are among the topics discussed. Processing efficiency and performance evaluations of injection molding high and low density polypropylenes, and industrial applications are included. (This updated bibliography contains 178 citations, 46 of which are new entries to the previous edition.)

536,158
PB85-862035/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Mineral Fillers in Plastics and Elastomers. June 1983-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for Jun 83-Jun 85.
Jun 85, 128p
Supersedes PB84-868363.

This bibliography contains citations concerning the utilization of such mineral fillers as talc, calcium carbonate, clay, wollastonite, mica, silica and boron in plastics and elastomers. Mechanical, electrical and tribological properties relative to flexural strength, abrasion resistance, heat stability, impact resistance, electrical conductivity, chemical resistance, dimensional stability and flame retardancy are considered. Effects of molding on mineral filled plastics and elastomers, and applications in electrical, electronic and automotive industries are also included. (This updated bibliography contains 165 citations, 81 of which are new entries to the previous edition.)

536,159
PB85-862282/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Hydrophobic Polymers. 1973-February 1983 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Feb 83.
Jun 85, 257p

This bibliography contains citations concerning moisture absorption properties; hydrophilization of such polymers as polyethylene, polypropylene, saturated polyesters, silicon and TFE; analysis; synthesis; formulation; microstructure; and performance of hydrophobic polymers. Surgical, biological, mechanical, and electrical applications are discussed. (This updated bibliography contains 247 citations, none of which are new entries to the previous edition.)

536,160
PB85-862290/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Hydrophobic Polymers. March 1983-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for Mar 83-Jun 85.
Jun 85, 126p
Supersedes PB83-860692.

This bibliography contains citations concerning moisture absorption properties; hydrophilization of such polymers as polyethylene, polypropylene, saturated polyesters, silicon and TFE; analysis; synthesis; formulation; microstructure; and performance of hydrophobic polymers. Surgical, biological, mechanical, and electrical applications are discussed. (This updated bibliography contains 126 citations, all of which are new entries to the previous edition.)

536,161
PB85-862332/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Carbon Fiber Reinforced Plastics (Nongraphite): Aerospace Applications. 1973-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Jun 85.
Jun 85, 129p
Supersedes PB84-868942.

This bibliography contains citations concerning applications of carbon fiber reinforced plastics (CFRP) in the aerospace industry. Manufacture techniques and properties of CFRP for spacecraft and aircraft applications are evaluated and tested. The uses of CFRP for light weight and high strength materials, and environmental considerations in aerospace applications are included. (This updated bibliography contains 194 citations, 51 of which are new entries to the previous edition.)

11J. Rubbers

536,162
PB85-202588 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Experiments on the Small Strain Behavior of Crosslinked Natural Rubber. 2. Extension and Compression.
Final rept.,
G. B. McKenna, and L. J. Zapas. 1983, 5p
See also PB85-104750.
Pub. in Polymer 24, n11 p1502-1506 Nov 83.

Experiments were carried out to characterize the small strain tension and compression behavior of dicumyl peroxide crosslinked natural rubber. Strains which were smaller by an order of magnitude than any reported previously on natural rubber were achieved. The authors results support the contention that the compression and extension moduli of natural rubber are different. A new finding is reported. That is, the moduli in tension and compression do not become constant but rather they increase significantly as zero deformation is approached.

536,163
PB85-861185/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Guayule Rubber: Cultivation and Manufacture. 1977-May 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1977-May 85.
Jun 85, 122p
Supersedes PB83-870618.

This bibliography contains citations concerning research and development of guayule as a natural rubber source. Cultivation methods and locations, physical and chemical properties, economic factors of cultivation through manufacture, production forecasts, effects of mixing with synthetic rubbers, and vulcanization are among the topics discussed. Industrial health hazards, performance in the world market, and applications are considered. (This updated bibliography contains 206 citations, 39 of which are new entries to the previous edition.)

536,164
PB85-862324/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Thermoplastic Elastomers: Olefin Resins. 1977-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1977-Jun 85.
Jun 85, 76p
Supersedes PB84-868736.

This bibliography contains citations concerning the development, manufacture, structure, properties, processing and applications of thermoplastic elastomers based on polyolefin blends. Polyethylene and polypropylene alloys are emphasized in this bibliography. Automobile, medical, packaging, and footwear applications are included as well as performance evaluations, modifier effects and tradenames. (This updated bibliography contains 104 citations, 16 of which are new entries to the previous edition.)

11L. Wood and Paper Products

536,165
PB85-188092/GAR PC **A02**/MF **A01**
Southeastern Forest Experiment Station, Asheville, NC.
Effect of Accelerated Aging on the Bending Strength and Stiffness of COM-PLY (Trade Name) Truss Lumber Produced in a Pilot Plant,
R. H. McAlister. Feb 85, 9p FSRN-SE-330, SE-85-8

COM-PLY truss lumber produced in a pilot plant was subjected to the ASTM D 1037 6-cycle accelerated aging test. The objective of the study was to determine if this pilot plant production met the proposed durability requirement for COM-PLY structural products. Actual reductions in stiffness and strength amounted to 23 percent for MOE and 32 percent for MOR. These reductions in properties are much less than the 50 percent reduction allowed in the proposed standards.

536,166
PB85-861151/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pulping: Energy Consumption and Conservation. 1976-May 1985 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-May 85.
Jun 85, 126p
Supersedes PB83-862359.

This bibliography contains citations concerning energy saving processes, machinery and plants applicable to the pulping industry. Water removal and wet pressing, small power steam and electricity generation, mathematical modelling for determining energy consumption, mechanical pulping energy reduction techniques, fiber pretreatment, cooking methods and equipment, and heat recovery processes are among the topics included. Energy efficient pulp mill operation management is included. (This updated bibliography contains 163 citations, 79 of which are new entries to the previous edition.)

536,167
PB85-861177/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Filler Retention in Papermaking. 1976-May 1985 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-May 85.
Jun 85, 111p

This bibliography contains citations concerning agents, mechanisms, and apparatus used for the retention of fillers in the preparation of stock and the manufacture of such papers as newsprint, board stock, carton material, catalog papers, and fine writing papers. Among the inorganic, natural organic, and synthetic organic retention aids discussed are polyethylene oxide, acrylamide-based polymers, starch, and polyelectrolytes. Pigment particle retention, paper quality and characteristics, and performance evaluations of retention aids and mechanisms are considered. (Contains 137 citations fully indexed and including a title list.)

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

536,168
AD-A153 418/9 Not available NTIS
Washington State Univ., Pullman. Dept. of Computer Science.
Ellipsoid Algorithm and the Graph Isomorphism Problem.
Rept. for 1983-1984,
G. M. Prabhu, and N. Deo. 1984, 8p ARO-18360.12-EL
Contract DAAG29-82-K-0107
Availability: Pub. in Technique et Science Informatiques, v3 n5 p327-333 1984 (No copies furnished by DTIC/NTIS).

An attempt is made to solve the graph-isomorphism problem by first formulating it as an integer LP problem and then applying the Ellipsoid algorithm of L. G. Khachian. This provides some new insight into the complexity of the isomorphism problem. (Author)

536,169
AD-A153 419/7 Not available NTIS
Wisconsin Univ.-Madison. Mathematics Research Center.
Existence of Infinitely Many Solutions for a Forward Backward Heat Equation,
K. Hoellig. Jul 83, 19p ARO-16415.721-MA
Contract DAAG29-80-C-0041, Grant NSF-MCS79-27062
Availability: Pub. in Transactions of the American Mathematical Society, v278 n1 p299-315 Jul 83 (No copies furnished by DTIC/NTIS).

This reprint presents a piecewise linear function which satisfies a certain condition and which is monotone decreasing on an interval. It is shown that in a certain case, there exists a certain condition that a initial boundary value problem has infinitely many solutions.

536,170
AD-A153 422/1 Not available NTIS
New York Univ., NY. Courant Inst. of Mathematical Sciences.
Asymptotically Self-Similar Blow-up of Semilinear Heat Equations,
Y. Giga, and R. V. Kohn. 1985, 23p
Contract N00014-83-K-0536, Grant NSF-MCS82-01308
Availability: Pub. in Communications on Pure and Applied Mathematics, v38 p297-319 1985 (No copies furnished by DTIC/NTIS).

This reprint studies the blow-up of solutions of a nonlinear heat equation. The main goal is to characterize the asymptotic behavior of u near a singularity, assuming a suitable upper bound on the rate of blowup.

536,171
AD-A153 430/4 Not available NTIS
New York Univ., NY. Courant Inst. of Mathematical Sciences.
Global Existence for a Nonlinear Theory of Bubbly Liquids,
R. E. Caflisch. 1985, 10p
Contract N00014-81-K-0002
Availability: Pub. in Communications on Pure and Applied Mathematics, v38 p157-166 1985 (No copies furnished by DTIC/NTIS).

Global existence of smooth solutions is proved for an effective theory of bubbly liquids for either the initial value problem or initial boundary problem in one dimension. This shows that the theory does not describe shock waves or bubble collapse. Since the analysis is not for steady boundary value problem, there is no discussion of resonance. The proof uses a semilinear form of equations to get local existence, A priori bounds resulting from energy conservation and a nonlinear Gronwall-like inequality are then derived to prove global existence.

536,172
AD-A153 440/3 Not available NTIS
Princeton Univ., NJ.
Unbiased Monte Carlo Integration Methods with Exactness for Low Order Polynomials,
A. F. Siegel, and F. O'Brien. Jan 85, 14p ARO-19442.22-MA
Contracts DAAG29-82-K-0178, DE-AC02-81ER10841
Availability: Pub. in SIAM Jnl. on Scientific and Statistical Computing, v6 n1 p169-181, Jan 85 (No copies furnished by DTIC/NTIS).

We consider methods for estimation of the integral of a given function that combine the unbiasedness of Monte Carlo integration (which permits a simple statistical assessment of the error) with the higher precision often attained by deterministic methods, We propose

symmetric random designs with 2k + 1 points that achieve exactness of polynomials of degee up to 2k + 1. The distribution for the three-point method is unique, although for higher order methods there are multiple choices for sampling distribution. For two-dimensional multiple integration over a rectangle, we propose an unbiased five-point method that achieves exactness for polynomials of degree up to three in both variables. Some bounds on error variances are given.

536,173
AD-A153 484/3/GAR PC **A02/MF A01**
Yale Univ., New Haven, CT. Dept. of Computer Science.
Solving Elliptic Partial Differential Equations on the Hypercube Multiprocessor.
Research rept.,
T. F. Chan, Y Saad, and M. H.Schultz. Mar 85, 9p
Rept no. YALEU/DCS/RR-373
Contracts N00014-82-K-0814, DE-AC02-81ER10996

This report discusses the implementation of several classical methods for solving elliptic partial differential equations on the hypercube multiprocessor. The methods considered are the Alternating Directions Implicit (ADI) algorithm, a direct banded Gaussian elimination method and multigrid methods. The complexity analysis of these algorithms shows that high efficiencies can be achieved by carefully assigning the data to the processors and (sometimes) resorting to more parallelizable methods. The binary reflected Gray code plays and important role for both the multigrid and the ADI algorithms. (Author)

536,174
AD-A153 474/2/GAR PC **A03/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Nonparametric Renewal Function Estimation.
Technical summary rept.,
E. W. Frees. Jan 85, 28p Rept no. MRC-TSR-2785
Contract DAAG29-80-C-0041

The renewal function is a basic tool used in many probabilistic models and sequential analysis. Based on a random sample of size n, a nonparametric estimator of the renewal function is introduced. Asymptotic properties of the estimator such as the almost sure consistency and local asymptotic normality are developed. A discussion of an application of the estimator is also provided.

536,175
AD-A153 493/2 Not available NTIS
Stanford Univ., CA.
Zero Dispersion Limit of the Korteweg-de Vries Equation for Initial Potentials with Non-Trivial Reflection Coefficient.
S. Venakides. 1985, 31p
Contract DE-AC02-76ERO-7077-V
Availability: Pub. in Communications on Pure and Applied Mathematics, v38 p125-155 198;5 (No copies furnished by DTIC/NTIS).

The inverse scattering method is used to determine the distribution limit of the solution of the initial value problem. The computation of the distribution limit is reduced to a quadratic maximization problem, which is then solved.

536,176
AD-A153 515/2/GAR PC **A03/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Effect of Some Estimators on a Large Sample Approximation to the Non-Null Distribution of the Pearson Chi-Square Statistic.
Technical summary rept.,
A. E. Muhly, and J. Gurland. Feb 85, 42p Rept no. MRC-TSR-2793
Contract DAAG29-80-C-0041

In this paper three distinct formulations of the Pearson chi-square test statistic, each of which employs random interval boundaries, are considered in presenting an answer to the following problem: Given a finite sample size and specified fixed composite null and alternative hypotheses, which method of estimation of the unknown parameters leads to a test which is most sensitive to departures from the null hypothesis in the direction of the fixed alternative. The proposed answer is based on a finite sample size approximation to the distribution of the appropriate quadratic form under the alternative hypothesis.

536,177
AD-A153 516/0/GAR PC **A02/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Studies in Quality Improvement. 1. Dispersion Effects from Fractional Designs. Revised.
Technical summary rept.,
G. E. P. Box, and R. D. Meyer. Feb 85, 24p Rept no. MRC-TSR-2796
Contract DAAG29-80-C-0041
Revision of report dated Sep 84, AD-A149 455.

Fractional factorial designs have been used successfully in industry and elsewhere to detect and estimate sparse factor effects. The effects usually envisioned measure changes in location associated with the experimental factors. In this paper we consider the possibility of detecting and estimating sparse dispersion effects measuring changes in variance associated with the factors. Key words: Fractional factorials, Industrial experimentation, Location effects, Dispersion effects, Model identification.

536,178
AD-A153 521/0/GAR PC **A03/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Cauchy Problem for Ut = Delta u(m) When 0 < m < 1.
Technical summary rept.,
M. A. Herrero, and M. Pierre. Jan 85, 28p Rept no. MRC/TSR-2784
Contracts DAAG29-80-C-0041, DAJA37-81-C-0020

This paper deals with the Cauchy problem for the nonlinear diffusion equation (fast diffusion case). We prove that there exists a global time solution for any locally integrable function u sub o: hence, no growth condition at infinity for u sub o is required. Moreover the solution is shown to be unique in that class.

536,179
AD-A153 523/6/GAR PC **A02/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Nonparametric Estimation of the Probability of Ruin.
Technical summary rept.,
E. W. Frees. Feb 85, 20p Rept no. MRC/TSR-2795
Contract DAAG29-80-C-0041

The finite and infinite horizon time probability of ruin are important parameters in the study of acturial risk theory. This paper introduces procedures for directly estimating these key parameters from a random sample of observations without assumptions as to the parametric form of the distribution from which the observations arise. The estimators introduced apply to most of the classical models in which ruin probabilities are used and also apply to a much broader class of models. The procedures are based on the concept of sample reuse, and old idea in statistics which is becoming more popular due to the widespread availability of high speed computers. In this paper, the almost sure consistency of the estimators is established, Further, finite sample properties of the estimators are investigated in a simulation study.

536,180
AD-A153 527/7/GAR PC **A02/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
About Product Formulas with Variable Step-Size.
Technical summary rept.,
M. Pierre, and M. Rihani. Jan 85, 19p Rept no. MRC/TSR-2783
Contract DAAG29-80-C-0041

The goal of this paper is to decide whether the Chernoff formula is valid when the step-size is variable. It turns out that under the usual assumptions instability and lack of convergence can appear as soon as the step size is slightly perturbed. We give here an example in that direction. However, we prove that slightly stronger assumptions can prevent these pathological situations.

536,181
AD-A153 528/5/GAR PC **A03/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Sensitivity Analysis of Initial Value Problems with Mixed Ode's and Algebraic Equations.
Technical summary rept.,
M. Caracotsios, and W. E. Stewart. Dec 84, 34p
Rept no. MRC/TSR-2777
Contract DAAG29-80-C-0041, Grant NSF-CPE83-08748

An efficient method is described for sensitivity analysis of nonlinear initial value problems, which may include algebraic equations as well as ordinary differential equations. The linearity of the sensitivity equations is utilized to solve them directly via the local Jacobian of the state equations. The method is implemented with the implicit integrator DASSL and is demonstrated on a stiff industrial reaction model.

536,182
AD-A153 534/3/GAR PC **A03/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Least-Squares Approximation to Minimum Chi-Square Estimators of Location and Scale Parameters and Their Effect on the Pearson Chi-Square Test.
Technical summary rept.,
A. E. Muhly, and J. Gurland. Feb 85, 31p Rept no. MRC-TSR-2792
Contract DAAG29-80-C-0041

Application of the Pearson chi-square test to goodness of fit of a distribution often leads to serious difficulties, particularly in the formation of intervals (as in the case of a continuous distribution) and in the estimation of unknown parameters. Under suitable conditions and with appropriately constructed estimators of the parameters, the test statistic converges in distribution to that of chi-square as the sample size increases. In the present paper, a comparatively simple least-squares approximation to the minimum chi-square estimator is developed which, when appropriately implemented, results in an asymptotic chi-square distribution of the test statistic. This estimator is developed for the cases of fixed and random intervals, and the role of the underlying assumptions is studied in detail.

536,183
AD-A153 535/0/GAR PC **A05/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Infinite Dimensional Linear Systems with Unbounded Control and Observation: A Functional Analytic Approach.
Technical summary rept.,
D. Salamon. Feb 85, 91p Rept no. MRC-TSR-2794
Contract DAAG29-80-C-0041, Grant NSF-DMS82-10950

The object of these notes is to develop a unifying framework for the functional analytic representation of infinite dimensional linear systems with unbounded input and output operators. On the basis of the general approach new results are derived on the wellposedness of feedback systems and on the linear quadratic control problem. The implications of the theory for large classes of functional and partial differential equations are discussed in detail.

536,184
AD-A153 538/4 Not available NTIS
Wisconsin Univ.-Madison. Mathematics Research Center.
Morse-Type Index Theory for Flows and Periodic Solutions for Hamiltonian Equations.
C. Conley, and E. Zehnder. 1984, 48p ARO-16415.480-MA
Contract DAAG29-80-C-0041
Availability: Pub. in Communications on Pure and Applied Mathematics, v37 p207-253, 1984 (No copies furnished by DTIC/NTIS).

In this reprint an index theory for flows is presented which extends the classical Morse theory for gradient flows on compact manifolds. The theory is used to prove a Morse-type existence statement for periodic solutions of a time-dependent (periodic in time) and asymptotically linear Hamiltonian equation.

536,185
AD-A153 539/2/GAR PC **A02/MF A01**
Wisconsin Univ.-Madison. Mathematics Research Center.

Studies in Quality Improvement II. An Analysis for Unreplicated Fractional Factorials.
Summary rept.,
G. E. P. Box, and R. D. Meyer. Mar 85, 19p Rept no. MRC-TSR-2797
Contract DAAG29-80-C-0041

In industrial experimentation it is frequently true that a large proportion of process variation is associated with a small proportion of the process variables. In such circumstances of effect sparsity unreplicated fractional designs have frequently been effective in isolating preponderant factors. A very useful graphical analysis for such experiments due to Cuthbert Daniel employs normal probability plotting. A more formal analysis is presented here which might be used to supplement such plots.

536,186
AD-A153 540/0/GAR PC A02/MF A01
Wisconsin Univ.-Madison. Mathematics Research Center.
Approximating a Set-Valued Function Locally.
Summary rept.,
V. F. Demyanov, C. Lemarechal, and J. Zowe. Jan 85, 10p Rept no. MRC-TSR-2786
Contract DAAG29-80-C-0041

Given a multi-valued mapping F, we address the problem of finding another multi-valued mapping H that agrees locally with F in some sense. We show that, contrary to the scalar case, introducing a derivative of F is hardly convenient. For the case when F is convex-compact-valued, we give some possible approximations, and at the same time we show their limitations. The present paper is limited to informal demonstration of concepts and mechanisms. Formal statements and proofs will be published elsewhere.

536,187
AD-A153 541/8/GAR PC A02/MF A01
Wisconsin Univ.-Madison. Mathematics Research Center.
Limit Theorems for the Method of Replication.
Summary rept.,
P. W. Glynn. Feb 85, 16p Rept no. MRC-TSR-2789
Contract DAAG29-80-C-0041, Grant ECS-8404809

A method of replication is frequently used by simulators to estimate steady-state quantities. In this paper, we obtain conditions under which this method yields asymptotically valid confidence intervals for steady-state means.

536,188
AD-A153 544/2 Not available NTIS
Howard Univ., Washington, DC. Dept. of Mathematics.
Jackson-Type Theorem for Averages of Splines Bounding a Class of Differentiable Functions.
L. A. Raphael. Feb 85, 9p ARO-18228.1-MA-H
Grant DAAG29-81-G-0011
Availability: Pub. in Jnl. of Approximation Theory, v43 n2 p124-131 Feb 85 (No copies furnished by DTIC/NTIS).

This reprint gives a variation of a Jackson-type theorem by Andreev, Popov, and Sendov for best one-sided approximations by splines. The main theorem states how well a function can be approximated by the average of upper and lower bounding splines of a given order with respect to the L sub p = L sub p (0,1) norm of a modified modulus of continuity.

536,189
AD-A153 633/3/GAR PC A02/MF A01
Stanford Univ., CA. Dept. of Statistics.
Fixed Width Interval Estimation in Linear Regression.
Technical rept.,
A. Y. C. Kuk. 7 Mar 85, 13p Rept no. TR-354
Contract N00014-76-C-0475

We discuss fixed-width interval estimation for the slope parameter in a simple linear regression when the X sub i are also normally distributed. A two-stage procedure that combines prediction with estimation is described. In addition, we discuss two sequential procedures. The confidence intervals obtained are used to construct tests with level and power at least independent of the values of the other parameters. We also consider a sequential procedure based on the distribution of the sample correlation coefficient; the resulting test attains the specified level and power asymptotically.

536,190
AD-A153 662/2/GAR PC A05/MF A01
Massachusetts Inst. of Tech., Cambridge. Statistics Center.
Robust Estimator of Location Using an Adaptive Spline Model.
Technical rept.,
D. Y. Kim. Mar 85, 94p Rept no. TR-37-ONR
Contract N00014-75-C-0555

This paper contains a new approach toward the robust estimation of a location parameter. We propose NPS (Normal Pareto Spline) distribution which provides rough fit to density functions for arbitrary unimodal symmetric distributions. The bases of our NPS estimation are Pareto tails and spline constraints. Pareto tails can represent a diversity of tail behavior, and spline constraints ensure the smoothness of the density function. We show that the NPS estimate of location has lower asymptotic variance than Huber's M-estimator in most cases, regardless of how Huber's trimmed constant k is chosen. We also show that the NPS estimate of location can guarantee resistance for outliers. For the generalized two sample location problem, where the scale parameters are unequal, we propose an iterative method to estimate the shift parameter and also have a proof that this iterative method converges to the desired M-estimate for an arbitrary scale location family of symmetric distributions.

536,191
AD-A153 785/1/GAR PC A02/MF A01
Pittsburgh Univ., PA. Center for Multivariate Analysis.
Detection of Multivariate Outliers with Dispersion Slippage in Elliptically Symmetric Distributions.
Technical rept.,
R. Das, and B. K. Sinha. Mar 85, 15p TR-85-04, AFOSR-TR-85-0366
Contract F49620-85-C-0008

An extension of Ferguson's univariate normal results for detection of outliers with variance slippage is made to the multivariate elliptically symmetric case with dispersion slippage. The locally optimum test statistic derived possesses all three robustness properties: optimality, null and nonnull. As a technical tool, Wijsman's representation theorem is used. (Author)

536,192
AD-A153 786/9/GAR PC A02/MF A01
Pittsburgh Univ., PA. Center for Multivariate Analysis.
Characterization of Nonnegatively Estimable Linear Combinations of Variance Components.
Technical rept.,
T. Mathew. Mar 85, 17p TR-85-06, AFOSR-TR-85-0353
Contract F49620-85-C-0008

This document shows that, by a reparametrization, the problem of estimating a linear combination of variance components can be reduced to that of estimating single variance component. Such a reduction is used to obtain some characterizations of nonnegatively estimable linear combinations of various components, Characterization of nonnegative estimability using MINQUE is also discussed.

536,193
AD-A153 789/3/GAR PC A03/MF A01
North Carolina Univ. at Chapel Hill. Center for Stochastic Processes.
Extent to which Least-Squares Cross-Validation Minimises Integrated Square Error in Nonparametric Density Estimation.
Technical rept.,
P. Hall, and J. S. Marron. Feb 85, 27p TR-94, AFOSR-TR-85-0401
Contract F49620-82-C-0009

Keywords: Windows; Kernel density estimates; Asymptotic properties; Distribution functions; Nonparametric statistics; Random variables; Stochastic processes.

536,194
AD-A153 790/1/GAR PC A02/MF A01
North Carolina Univ. at Chapel Hill. Dept. of Statistics.
Moment Inequalities for Real and Vector p-Stable Stochastic Integrals.
Technical rept.,
W. A. Woyczynski. Dec 84, 20p TR-87, AFOSR-TR-85-0403
Contract F49620-82-C-0009
Presented at the International Conference on Probability in Banach Space, 1984, Medford, MA.

This paper describes moment inequalities for single and double stochastic integrals with respect to p-stable motion. The proofs are based on the author's work on the structure of single and multiple p-stable integrals and inequalities for moments of exit times of a p-stable motion in previous works. Its results do not apply directly to the situation in which the author's want to use them, in particular, because one dimensional processes are explicitly excluded there. So they offer the needed variation of their result. The author's propose an extension of the theory of stochastic integration with respect to a p-stable motion, to the case when the latter takes values in a Banach space.

536,195
AD-A153 840/4/GAR PC A03/MF A01
Iowa Univ., Iowa City.
Bayesian Inference and Diagnostics for the Three Parameter Logistic Model.
Technical rept. 1 Jul 83-8 Apr 84,
T. Leonard, and M. R. Novick. 8 Apr 85, 29p Rept no. TR-85-5-ONR
Contract N00014-83-C-0514

Allan Birnbaum made two historical contributions to the theories of statistics and educational testing. The first was his famous 1962 proof that the sufficiency and conditionality principles together imply the likelihood principle, thus justifying conditional, e.g., Bayesian, inference when compared with frequentist inference. The second was his famous mental test model introduced in Lord and Novick (1968). This proposal attempts to follow in Birnbaum's tradition by using Bayesian ideas to show that his mental test model possesses even broader applicability than hitherto realized. A conditional maximization procedure is used to approximate numerical integrations thus broadening the scope of Bayesian inference and model checking.

536,196
AD-A153 841/2/GAR PC A04/MF A01
Iowa Univ., Iowa City.
Bayesian Full Rank Marginalization for Two-Way Contingency Tables.
Technical rept. 1 Jul 83-5 Apr 85,
T. Leonard, and M. R. Novick. 5 Apr 85, 59p Rept no. TR-85-4-ONR
Contract N00014-83-C-0514

A general approach is proposed for modeling the structure of a two-way contingency table, and for drawing inferences about the marginal and interaction effects, cell parameters, and conditional probabilities. The prior distribution expresses uncertainty in a simple reduced model, in particular the independence model. The posterior estimates of the cell parameters then provide compromises between the cell frequencies and fitted values obtained under the reduced model. In a mental test context, the reduced independece model is identical to Rasch's multiplicative Poisson model, and we therefore incorporate a procedure for checking the adequacy of this model. Using some general ideas on marginalization, it is possible to compute reasonable approximations to the full posterior densities of many parameters of interest thus permitting thorough parametric inference and statistical modeling. It is possible to proceed with the full interaction model even in the presence of zero cell frequencies. All prior parameters are evaluated with the assistance of the data via a hierarchical Bayes procedure, thus permitting the sensible analysis of data sets. An r x s cross classification of 5648 Marine Corps clerical students by school and test grade is analyzed in detail and the posterior densities of the 96 possible interactions are used to suggest a simplified structure partitioning and collapsing the table into a meaningful 3 x 2 table.

536,197
AD-A153 887/5/GAR PC A03/MF A01
Wisconsin Univ.-Madison. Dept. of Computer Sciences.
MGR (Upalion) Multigrid Methods.
Technical rept.,
D. Kamowitz, and S. V. Parter. Jan 85, 38p CSTR-575, AFOSR-TR-85-0351
Grant AFOSR-82-0275

Multigrid methods are proving themselves as (very) successful tools for the solution of the algebraic equations associated with discretization of Elliptic Boundary-Value problems. Nevertheless, it seems we are just beginning to 'understand' this powerful idea. Hence, there is a need for continued probing, experimentation and new proofs - less for the sake of proof and more

for the sake of insight. This report considers the extension to a general diffusion equation. In particular, for the two-grid scheme we reobtain the basic results indicate that other coefficients results carry over as well.

536,198
AD-A153 949/3/GAR PC **A03**/MF **A01**
Chicago Univ., IL. Center for Decision Research.
Accepting Error to Make Less Error.
Technical rept.,
H. J. Einhorn. Apr 85, 26p Rept no. TR-14
Contract N00014-84-C-0018

It is argued that the clinical and statistical approaches rest on different assumptions about the nature of random error and the appropriate level of accuracy to be expected in prediction. To examine this, a case is made for each approach. The clinical approach is characterized as being deterministic, causal, and less concerned with prediction than with diagnosis and treatment. The statistical approach accepts error as inevitable and in so doing, makes less error in prediction. This is illustrated using examples from probability learning and equal weighting in linear models. Thereafter, a decision analysis of the two approaches is proposed. Of particular importance are the errors that characterize approach; myths, magic, and illusions of control in the clinical; lost opportunities and illusions of the lack of control in the statistical. It is concluded that each approach represents a gamble with corresponding risks and benefits.

536,199
AD-A153 950/1/GAR PC **A07**/MF **A01**
Naval Underwater Systems Center, New London, CT. New London Lab.
Evaluation of Densities and Distributions via Hermite and Generalized Laguerre Series Employing High-Order Expansion Coefficients Determined Recursively via Moments or Cumulants.
Technical rept.,
A. H. Nuttall. 28 Feb 85, 139p Rept no. NUSC-TR-7377

In the theoretical analysis of performance of some systems with nonlinearities and/or memory, it often happens that the only statistics about the decision (or output) random variable of interest that can be easily found are the moments, or in other cases, the cumulants. Explicit relations for the low-order expansion coefficients in Edgeworth of Gram-Charlier series are available in terms of the available moments or cumulants. However, for higher-order moments and cumulants, these explicit nonrecursive relations are very tedious to derive, become extremely lengthy, and are not practical to use. This document addresses the problem of obtaining accurate high-order series expansion approximations of the probability density function and cumulative distribution function of a random variable of interest, in terms of the available moments or cumulants of that random available. The necessity of being available to approximate probability density functions and cumulative distribution functions from knowledge of either moments or the cumulants, is that some physical problems have these particular statistics as natural and convenient starting points.

536,200
DE85009665/GAR PC **A02**/MF **A01**
Argonne National Lab., IL.
Extrapolation Methods for Multi-Dimensional Quadrature of Singular and Regular Integrand Functions.
J. N. Lyness. Feb 85, 23p ANL/MCS-TM-45
Contract W-31-109-ENG-38

The principal purpose of this article is to draw the readers' attention to the existence of various expansions on which extrapolation may be based. Relatively few expansions in quadrature are known. These are usually simple to state and simple to use, but some require long involved proofs (which are not given here). We also discuss a simple way to use them. A secondary purpose is to indicate how some of the elementary theory of numerical quadrature can be used on the Euler Maclaurin summation formula. If this is done, extrapolation in quadrature can be seen as a natural integrated branch of numerical quadrature and not (as is to often the case in textbooks) as an apparently independent theory. The development of an extrapolation technique is conveniently considered in three phases. The first phase involves choosing a suitable expansion on which to base the extrapolation. The second consists of deciding on a quadrature rule and a mesh ratio sequence. A third phase involves choosing an efficient algorithm for the extrapolation calculation. (ERA citation 10:023363)

536,201
DE85700451/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Discrete Group Invariant Factorizable S-Matrices.
E. Abdalla, M. C. B. Abdalla, and A. L. Santos. Sep 82, 8p IFUSP-P-359
U.S. Sales Only.

The possibility of obtaining factorizable non trivial S-matrices, invariant under finite symmetry groups is commented. (Atomindex citation 16:007422)

536,202
DE85700457/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
How Universal is the Period Doubling Phenomenon in Equations with Quadratic Nonlinearity.
C. P. Malta, and C. R. de Oliveira. Sep 83, 20p IFUSP-P-427
U.S. Sales Only.

Varying one parameter, the solution of nonlinear 1 sup(st) order differential equation with time delay tau is Fourier analysed. After the Hopf bifurcation, period-doubling phenomenon always occurs when tau is one of the fixed parameters (both for small and large tau). Varying tau, there are values of the fixed parameters for which no period-doubling occurs. 'Chaos' follows the period-doubling sequence and the rate at which 'chaos' is approached is very close to the universal delta = 4.6692016... characterising the period-doubling sequence to chaos in nonlinear difference equations. (Atomindex citation 16:007426)

536,203
PB85-185445/GAR PC **E04**/MF **E04**
Oxford Univ. (England). Dept. of Engineering Science.
Multivariable Model-Following Self-Tuning Control with Offset Rejection,
R. Scattolini, and D. W. Clarke. 1985, 27p OUEL-1572/85

A novel self-tuning controller for multivariable systems is presented. The main goal of the paper is to derive an algorithm based on model-following ideas and requiring only a partial knowledge of the system interactor matrix. The assumption is made that the system under control is described by a CARIMA model. It is shown that the closed-loop system exhibits intergrating properties, thus ensuring the robust rejection of constant load disturbances acting on the controlled plant. Finally, simulated examples are described which illustrate the main features of the proposed technique.

536,204
PB85-185452/GAR PC **E04**/MF **E04**
Oxford Univ. (England). Dept. of Engineering Science.
Extensions of the Small-mu Test for Robust Stability,
Y. K. Foo, and I. Postlethwaite. 1985, 32p OUEL-1573/85
See also PB84-200969.

In this paper, the notion of a topologically arcwise connected set is used to extend the small-mu test to accommodate unstable perturbations, and also to provide a switching criterion between a Nyquist and an inverse Nyquist based test and possibly between different nominal models. The extensions reduce conservatism and enable a more natural application of the small-mu test.

536,205
PB85-189637/GAR PC **E04**/MF **E01**
Technische Hogeschool, Delft (Netherlands). Onderafdeling der Wiskunde en Informatica.
Silhouettes: A Graphical Aid to the Interpretation and Validation of Cluster Analysis,
P. J. Rousseeuw. 1984, 31p REPT-84-41

A new graphical display is proposed for nonhierarchical cluster analysis. Each cluster is represented by a so-called silhouette, which is based on the comparison of its tightness and separation. This silhouette shows which objects lie well within their cluster, and which ones are merely somewhere in between clusters. The entire clustering is displayed by combining the silhouettes into a single plot, allowing an appreciation of the relative quality of the clusters and an overview of the data configuration. The average silhouette width provides an evaluation of clustering validity, and might be used to select an 'appropriate' number of clusters.

12B. Operations Research

536,206
AD-A153 476/7/GAR PC **A03**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Quadratic Programming Algorithm.
Technical summary rept.,
M. J. Best, and K. Ritter. Dec 84, 33p Rept no. MRC-TSR-2776
Contract DAAG29-80-C-0041

By using conjugate directions a method for solving convex quadratic programming problems is developed. The algorithm generates a sequence of feasible solutions and terminates after a finite number of iterations. Extensions of the algorithm for nonconvex and large structured quadratic programming problems is discussed.

536,207
AD-A153 513/7/GAR PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Computable Numerical Bounds for Lagrange Multipliers of Stationary Points of Nonconvex Differentiable Nonlinear Programs.
Technical summary rept.,
O. L. Mangasarian. Jan 85, 8p Rept no. MRC-TSR-2781
Contract DAAG29-80-C-0041, Grant NSF-MCS82-00632

It is shown that the satisfaction of a standard constraint qualification of mathematical programming at a stationary point of a nonconvex differentiable nonlinear program provides explicit numerical bounds for the set of all Lagrange multipliers associated with the stationary point. Solution of a single linear program gives a sharper bound together with an achievable bound on the 1-norm of the multipliers associated with the inequality constraints. The simplicity of obtaining these bounds contrasts sharply with the intractable NP-complete problem of computing an achievable upper bound on the p-norm of the multipliers associated with the equality constraints for integer p > or = 1.

536,208
AD-A153 514/5/GAR PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Variable-Complexity Norm Maximization Problem.
Technical summary rept.,
O. L. Mangasarian, and T. H. Shiau. Jan 85, 16p Rept no. MRC-TSR-2780
Contract DAAG29-80-C-0041, Grant NSF-MCS82-00632
Sponsored in part by Grant NSF-DMS82-10950.

The solution set to many important constrained optimization problems is a set that is bounded by planes. When such a set is bounded it is useful to find the size of a largest element in that set. In this work we show that this problem may be extremely easy or difficult depending on the measure of size (norm) employed. For one such measure the problem is relatively easy while for all other measures it is intractable. However the problem of merely finding an upper bound for the size of the largest element turns out to be a surprisingly simple problem that can be solved by a single linear program.

536,209
AD-A153 542/6/GAR PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Finding the Largest l(p)-Ball in a Polyhedral Set.
Summary rept.,
T. H. Shiau. Dec 84, 10p Rept no. MRC-TSR-2778
Contract DAAG29-80-C-0041, Grant DMS-8210950

A simple linear programming formulation is given for finding a ball or hypercube with largest radius contained in a polyhedral set defined by m linear inequalities. The linear program also has m linear constraints similar to those defining the set. It is shown that finding the largest ball is not much more difficult than finding a feasible point. When the center of ball is fixed, the largest radius is easily obtained as the smallest of m ratios. The results can be extended to balls defined by other norms such as elliptic norms.

536,210
AD-A153 814/9/GAR PC **A03/MF A01**
North Carolina Univ. at Chapel Hill. Center for Stochastic Precesses.
Limit Behaviour for Stochastic Monotonicity and Applications.
Technical rept.,
H. Cohn. Feb 85, 49p Tr-93, AFOSR-TR-85-0402
Contract F49620-82-C-0009

A transition probability function P is said to be stochastically monotone if P(x,-ALPHA,Y) is non-increasing in x for every fixed y. A (non-homogeneous) Markov chain or process is said to be stochastically monotone if its transition probability functions are stochastically monotone. Diffusions, random walks, birth-and-death and branching processes are examples of such models. It is shown that stochastically monotone processes exhibit two basic types of asymptotic behaviour. Chains with stationary transition probabilities display a cyclic pattern, and a suitably normed and centered chain turns out to converge almost surely if its is geometrically growing. Applications to diffusions and branching processes are added.

536,211
AD-A153 985/7/GAR PC **A03/MF A01**
Texas Univ. at Austin. Center for Cybernetic Studies.
Penalty Functions and Duality in Stochastic Programming via phi-Divergence Functionals.
Research rept.,
A. Ben-Tal, and M. Teboulle. Aug 84, 34p Rept no. CCS-499
Contract N00014-82-K-0295, Grant NSF-ECS82-14081

This paper considers stochastically constrained nonlinear programming problems. A penalty type method is suggested as a deterministic surrogate. The penalty is constructed in terms of a 'distance' function between random variables, given a term of the phi-divergence functional (a generalization of the relative entropy). A duality theory is developed in which a general relation between phi-divergence and utility functions is revealed, via the conjugate transform, and a new type of certainty equivalent concept emerges.

536,212
AD-A153 987/3/GAR PC **A03/MF A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
Performance Evaluation of Stochastic Timed Decision-Free Petri Nets,
R. P. Wiley. Mar 85, 41p Rept no. LIDS-P-1443
Contracts N00014-77-C-0532, N00014-84-K-0519

The advent of low-cost processors has made the construction of highly complex, decentralized systems feasible. These systems are usually divided into interacting components which operate concurrency and coordinate their operations by using an asynchronous protocol. Petri Nets have frequently been used to model such systems; they can model concurrency and asynchronous protocols. Specific examples of systems models by Petri Nets include computer systems communication protocols and manufacturing systems. This paper shows how the performance of a simple subclass of STNPs, that of Stochastic Timed Decision-Free Petri Nets (STDFPNs), can be predicted. This subclass can model concurrency and coordination, but not decisions, and have been used to model certain manufacturing systems. The major contribution is a new analysis technique which uses a set of equations that describe the behavior of that system. The resulting algorithms are computationally more attractive and the general approach can be extended to study less restrictive classes of SRPNs. This paper examines three related processes which describe firing times, relative firing times, and intertransition times. The first process introduces the new analytical technique, the second one provides convergence proof, and the third one allows performance measures of interest to be computed.

536,213
PB85-189645/GAR PC **E04/MF E01**
Technische Hogeschool, Delft (Netherlands). Onderafdeling der Wiskunde en Informatica.
Performance Evaluation of Non-Linear Optimization Methods via Pairwise Comparison and Fuzzy Numbers (Revised Edition),
F. A. Lootsma. 1984, 40p REPT-84-40
See also PB83-116277.

In this paper the author extends the deterministic performance evaluation of non-linear optimization methods. A pairwise comparison is done using fuzzy estimates of the performance ratios to obtain fuzzy final scores of the methods under consideration. The key instrument is the concept of fuzzy numbers with triangular membership functions. The algebraic operations on them are simple extensions of the operations on real numbers; they are exact in the parameters (lower, modal, and upper values), not necessarily exact in the shape of the membership function. The author illustrates the fuzzy performance evaluation by the ranking and rating of five methods (geometric programming and four general methods) for solving geometric-programming problems, using the results of recent computational studies. Some general methods appear to be leading, an outcome which is not only due to their performance under subjective criteria like domain of applications and simplicity of use; they also score higher under more objective criteria like robustness and efficiency.

13.

MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

536,214
AD-A153 707/5/GAR PC **A11/MF A01**
Army Military Personnel Center, Alexandria, VA.
Natural Convection in Square Partitioned Enclosures,
E. B. Zimmerman. 28 Mar 85, 244p

Natural convection heat transfer in square air filled enclosures with differentially heated vertical side walls and horizontal connecting end walls that were either perfectly conducting or Adiabatic have been investigated between Rayleigh numbers of 10,000 to 1,000,000 by a finite difference method. Enclosures that were free of obstructions and enclosures fitted with centrally mounted vertical baffles attached to the floor and ceiling were studied, Baffle conductivity was investigated at 2 and 500 times that of air. The size of the aperture opening between the upper and lower baffle was maintained at one half the enclosure height and the aperture location was varied to study the effects on the heat transfer and flow properties on the enclosure.

536,215
AD-A153 779/4/GAR PC **A09/MF A01**
Army Military Personnel Center, Alexandria, VA.
Computer-Aided Thermohydraulic Design of TEMA Type E Shell and Tube Heat Exchangers for Use in Low Pressure, Liquid-to-Liquid, Single Phase Applications.
Final rept.,
N. J. Kolar. 1 Apr 85, 185p
Master's thesis.

Classification, nomenclature, utilization and cost estimating of shell and tube heat exchangers are presented along with an historical overview of various methods currently employed in their design. A procedure for providing preliminary estimates of shell and tube heat exchanger design is developed in detail. The author formulates a computer program which employs this sizing algorithm for low pressure liquid-to-liquid heat exchanger applications. Additionally, problems encountered in the design and manufacture of shell and tube heat exchangers are described along with present methods of solution for each.

536,216
DE85009028/GAR PC **A02/MF A01**
Los Alamos National Lab., NM.
Simple Procedure for Schematic Design of Passive Solar Buildings.
W. O. Wray, and C. E. Kosiewicz. 1984, 19p LA-UR-84-865
Contract W-7405-ENG-36
Portions of this document are illegible in microfiche products.

A simple procedure for use during the schematic phase of passive solar building design is presented in this article. The procedure is quantitative and accurate enough to insure that designs based on the provided starting point values of the primary building parameters will be cost effective. (ERA citation 10:020344)

536,217
DE85009189/GAR PC **A02/MF A01**
Olson (Wayne R.), Catonsville, MD.
HOWSE (HOt Water SAver) Test Program. Final Report.
W. R. Olson. 15 Jun 83, 7p DOE/R3/08074-T1
Contract FG43-81R308074

The feasibility of recovering heat from a domestic dishwasher was demonstrated in a working, full scale model. That project showed it could be done. This test program showed the HOWSE to be effective and safe over a period of eighteen months. The data from the test program is essential to show safety for requesting approval for use of this appliance by building code authorities. (ERA citation 10:022790)

536,218
DE85009202/GAR PC **A03/MF A01**
Stone Family Dulcimers, Montrose, PA.
Unique Wood-Fired System for Domestic Hot Water Generation. Final Report.
Sep 81, 40p DOE/R3/06086-T1
Contract FG43-79R306086
Portions of this document are illegible in microfiche products.

This project has proven that it is possible to construct in a home workshop situation, a simple, durable, reasonably modest-cost stove and heat-exchanger which will conveniently generate wood-fueled hot water yearround to meet household needs and daily demand schedules. Included with this report are the illustrations, descriptions, and details which should make it possible for someone with the proper skills to construct their own system. However, before rushing out to buy copper and steel, it would be important for anyone to consider the costs, benefits, and possible alternatives available. Whatever the source of hot water, conservation is a major way of saving energy and money. Some major ways of conserving are to add extra insulation to the water heater tank, turning the heating elements down to 115 to 120 exp 0 F thermostat settings, using a timer to turn on the elements only during the time of day that hot water will be needed, using warm or cold water for laundry, and using flow-restricting shower heads. These measures can save up to 50% of the energy previously used, with very little investment. Total costs for the system using an existing water heater for the storage tank could range from $200 to over $1000. Assuming free firewood, at current utility prices this would make a pay-back period for original investment of only 8 months to 3 years 4 months for the average family. Considering these costs, one might reasonably wonder if it would be worthwhile to purchase and use a wood-fired system which would save only a dollar or less per daily use. This would amount to a rate of savings pay equal to no more than the minimum wage for the time involved. (ERA citation 10:022786)

536,219
DE85009380/GAR PC **A02/MF A01**
Southwest Virginia Community Coll., Richlands.
Design of Ceramic Firebox with Unipolar Fan Motor. Final Report.
C. F. Painter. 18 Oct 82, 6p DOE/R3/08097-T1
Contract FG43-81R308097

Progress made on the fabrication of the ceramic firebox is described. It would include a series of nickel-copper junctions. A unipolar motor is under development. (ERA citation 10:023362)

536,220
DE85006382/GAR PC **A04/MF A01**
Virginia Associated Research Campus, Newport News.
Research on the Energy Efficiency of Fireplaces. Final Report.
W. H. Phillips. Oct 82, 67p DOE/R3/08099-T1
Contract FG43-81R308099
Portions of this document are illegible in microfiche products.

Studies are presented of factors involved in improving the energy efficiency of fireplaces. A computer program is presented to represent the operation of a fireplace with a heat exchanger. The effects of fine-mesh screen wire for the fireplace screen and the effects of heat-exchanger design parameters are investigated. 12 references, 14 figures. (ERA citation 10:022791)

536,221
DE85780535/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Some Comments About the Comparison Between a Conventional and a Solar Powered Absorption Refrigeration System.
O. D. Corbella, and C. R. Garibotti. Aug 83, 12p IC-83/128
U.S. Sales Only.

Two statements about the performance of solar refrigeration systems are discussed. First, concepts of efficiency and coefficient of performance are studied. Second, the influence of inflation and rise of fuel prices are considered, in relation to the comparison between solar and conventional refrigeration systems. (Atomindex citation 15:062342)

536,222
DE85900453/GAR PC **A05/MF A01**
Technion - Israel Inst. of Tech., Haifa. Dept. of Mechanical Engineering.
Technion Swimming Pool: Comparison of Measurements with the Results of a Computer Simulation and Calculation of the Effects of Conservation Measures on the Heating Load.
E. Michelson, and A. Shitzer. Nov 84, 81p EEC-156
U.S. Sales Only. Portions of this document are illegible in microfiche products.

Measurments on the Technion indoor swimming pool taken in November 1981 are compared with the results of a computer simulation. Equations for calculating the heating loads of the pool hall, pool water and shower are presented. The measurement system used to monitor the energy subsystems in the pool is described. Validation of the computer model is included along with a brief discussion of the effects of conservation measures on the heating load. Economic considerations of solar heating retrofit are provided. A listing of the computer program is also included. (ERA citation 10:022793)

536,223
PB85-186781/GAR PC **E08/MF E08**
Commission of the European Communities, Luxembourg.
German Solar Pilot Test Facility: Construction and Performance of Solar Systems.
Final rept.,
R. Hanitsch, K. D. Bergmann, H. Bruening, and K. Tekes. c1984, 156p EUR-9317-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The report gives full information about all stages of the construction of solar pilot test facility, trials and validation, mastering the use of the test facilities, operation sequences, system behavior studies and collection of validation data for the modelling group to meet the objective of model improvement.

536,224
PB85-186340/GAR PC **A07/MF A01**
Midland-Ross Corp., Toledo, OH. Energy Technology Div.
High Temperature Heating System (HTHS). Final Report, March 1982 - November 1984,
S. R. Huebner. Nov 84, 132p GRI-85/0014
Contract GRI-5081-342-0574
See also PB83-256669.

Natural gas has potential to become an energy alternative to electrical resistance heating for process temperatures above 1800F in furnaces where controlled process atmospheres are required. This program is intended to develop and integrate into a system, a radiant tube gas-fired heating element, burner and energy recovery device. To obtain high heat flux and operate at high process temperatures, silicon carbide based ceramic materials have been selected for construction of the radiant tube. A thermal analysis has been performed and has shown that the heat flux of radiant tubes may be increased by application of a high combustion intensity burner and a heat transfer enhancement mechanism to increase the rate of heat transfer from the combustion products to the heating element. Based on this analysis, a radiant burner has been developed which is capable of burning ten (10) times as much fuel per unit of volume as conventional radiant tube burners. A closed end radiant tube with axial fins has been designed and tested in conjunction with the high combustion intensity radiant tube burner. This burner and radiant tube combination has demonstrated a 200 to 300 percent increase in heat flux compared to conventional systems.

536,225
PB85-189538/GAR PC **E04/MF E04**
Electricity Council Research Centre, Capenhurst (England).
Large Scale Applications of Heat Pumps,
B. J. Taylor, M. P. Bertinat, A. V. Heaton, R. Benstead, and D. L. Hodgett. c1984, 42p ECRC/M-1859
Sponsored by British Hydromechanics Research Association, Cranfield (England). Presented at BHRA International Symposium (2nd), York (England). September 25-27, 1984.

Contents: The design and evaluation of a 150C heat pump; Steam recompression drying; The assessment of heat pump assisted distillation using thermodynamic criteria. (Copyright (c) BHRA The Fluid Engineering Centre, 1984.)

536,226
PB85-189561/GAR PC **E07/MF E07**
Commission of the European Communities, Luxembourg.
Temporaere Thermische Isolierung bei der Passiven Solarnutzung (Temporary Thermal Insulation in the Passive Solar Utilisation),
W. Fuhse, A. Fuhse, F. J. Fuhse, I. Frank, and B. Hazebroucq. c1984, 136p EUR-8953-DE-EN
Text in German and English.
Customers in the European Community countries should apply to the Office for Official publications of the European Communities, B.P. 1003, Luxembourg.

A super insulating rolladen is developed, which gives an effective temporary thermal insulation (night insulation) for the passive solar utilization. The k-value of the thermal insulation device--in connection with a double glazing--is about 0.5 W/sq m K, which is the insulation of a very well insulated wall. In order to present a most cost effective design, the authors' research has focused on a concept, using standard rolladen components to a large extent. The work program covered conceptual work, set up of a testing- and proving stand, performance of heat transfer measurements and initiation of life tests and proving program. (Copyright (c) EGKS-EWG-EAG, Brussel-Luxemburg, 1984.)

536,227
PB85-189694/GAR PC **E03/MF E03**
Electricity Council Research Centre, Capenhurst (England).
Pressure Testing of Economy 7 Electric Storage Vessels,
F. R. Stephen. Aug 84, 23p ECRC/M-1838

The Economy 7 Electric Boiler is being promoted for space heating in dwellings. The boilers are large steel rectangular vessels, available in four capacities: 150, 200, 250 and 300 gallons. Vessels have been built to the Oil Storage Tank Standard BS799: Part 5, but this standard does not cover the elevated temperature or test pressure requirement. Furthermore, the standard caters for oil storage and not water so internal corrosion has to be considered. The vessel must be capable of withstanding a twice working pressure test without permanent distortion. In the Memorandum, guidelines are given for assessing vessels and a typical specification and test performance check is appended.

536,228
PB85-189967/GAR PC **E08/MF E08**
Commission of the European Communities, Luxembourg.
Irish Solar Pilot Test Facility: Final Operational Phase, October 1, 1981 - June 30, 1983,
I. J. Cowan. c1984, 200p EUR-9233-EN
See also PB85-158970.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

This report deals with the final operational phase of the Solar Pilot Test Facility. The history of work in the project, together with items of the work done for the last two heating seasons are discussed. Operation of the Solar Pilot Test Facility is described, including measurement and control problems associated with production and storage of data. System behavior studies for both solar sub-systems are discussed, including parametric studies and work undertaken in concert with the other project participants. The use of the test results for model validation is considered, and the relationship between the programs of the Solar Pilot Test Facility and European Modelling Group is discussed. Finally, conclusions are drawn, and recommendations made for further work in this field of research and development.

536,229
PB85-190957/GAR PC **E06/MF E06**
Electricity Council Research Centre, Capenhurst (England).
Control of Storage Heaters,
D. A. McIntyre. Feb 85, 91p ECRC/R-1686

Increases in the price of fossil fuels and the maintenance of a very favorable low rate tariff has meant that off-peak electric heating has once again become attractive economically. This report is concerned with how the charge input to storage radiators may be regulated, both in the case of 'simple' storage radiators which have no output control and for the case of controlled output systems. This is normally a conventional room thermostat operating the fan or pump of the heat distribution system. The report summarizes existing types of storage heater and control systems. A new control system for controlled input radiators is proposed, which combines weather sensing with room feedback.

536,230
PB85-191070/GAR PC **A03/MF A01**
Riley Stoker Corp., Worcester, MA.
Evaluation of a Prototype Burner for Combined NOx/SO2 Control,
R. A. Lisauskas, D. C. Itse, C. C. Masser, and A. R. Abele. 1985, 27p EPA/600/D-85/065
Contract EPA-68-02-3913
Prepared in cooperation with Energy and Environmental Research Corp., Irvine, CA.

The paper summarizes results of EPA-sponsored large pilot-scale combustion tests on a Riley Stoker second-generation low-NOx burner. Parametric tests were conducted on a single 29 MWt (100 million Btu/hr) prototype burner to determine conditions required for low-NOx operation and for combined NOx/SO2 control. SO2 reductions were evaluated for two sorbents, two injection locations, and three coals. NOx emissions of 150-250 ppm, corrected to 3% O2, were obtained under various combustion conditions. SO2 reductions of 31-57%, with no detrimental effect on NOx emissions, were observed.

536,231
PB85-192888/GAR PC **E03/MF E03**
Commission of the European Communities, Luxembourg.
Report on the Characterization of a Gas Controlled Heat Pipe Furnace,
J. V. McAllan. c1984, 43p EUR-9310-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The heat pipe has proved simple to operate and has provided a temperature enclosure of exceptional stability and uniformity. Changes in operating temperature are limited by the thermal transfer to the detector and the surrounding furnace, the heat pipe being extremely rapid in response. The heat pipe has been operated to 500C, and from 500 to 600C, and it has proved possible to measure the temperature gradient caused by vapor flow along the pipe; simple techniques to minimize this are outlined. Temperature changes occur in

the first hours after a major change of pressure, which may be related to gas absorption effects, but long-term drifts, measured over periods up to 20 days, are very small and their measurement is limited by the stability of the thermometers, especially above 800C. (Copyright (c) ECSC-EEC-EAEC, Brussels, Luxembourg, 1984.)

536,232
PB85-195139/GAR PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Recuperation of Energy in a Catering Type Dishwasher by Means of a Heat Pump (Recuperation de l'Energie par Pompe a Chaleur sur une Machine a Laver la Vaisselle de Collectivites).
Final rept.,
G. Schoeffler. c1984, 45p EUR-9010-EN-FR
Text in English and French.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The operation of catering type dishwashers consumes a lot of electricity, particularly to heat the water used for washing and rinsing of the dishware, and to keep it at the proper temperature level. The aims of the project were the study and realization of a heat pump adapted to a catering type dishwasher, the measurement of performance and energy consumption of a conventional type dishwasher and of the same dishwasher equipped with a heat pump for heat recovery from the vapor in the machine, as well as the comparison of the results of the two measurement programs. The report contains a description of the installation, the performance measurements, the difficulties encountered, and the commercial prospects.

536,233
PB85-198505/GAR PC **A03**/MF **A01**
Alzeta Corp., Mountain View, CA.
Advanced Refinery Process Heater. Annual Report October 1983 - September 1984,
R. J. Schreiber, J. A. Gotterba, and A. C. Minden.
Oct 84, 40p REPT-84-711-111, GRI-85/0020
Contract GRI-5083-231-0871

Activity during the first year of this project has focused on the conceptual design of the prototype heater and on the development of a custom-designed Pyrocore ceramic fiber burner for the heater. Three different concepts for the prototype heater have been produced, one of them modeled after a vertical cylindrical design and the other two resembling box-type heaters. All three concepts take advantage of the Pyrocore burner's flameless characteristic to make the heater more compact. Concerning the development of the burners, two different geometries were considered. Subscale prototypes of each type of burner were fabricated and tested. The more successful burners used actively-cooled edges to maintain the integrity of the gas-tight seals. Work on this project in the second year will include the design and fabrication of the 10 MMBtu/hr prototype heater, using the most feasible heater and burner designs developed during the first year.

536,234
PB85-199636/GAR PC **A07**/MF **A01**
Thermo Electron Corp., Waltham, MA.
Development of a High-Efficiency, Gas-Fired, Heat Pipe, Warm-Air Heating System. Final Report January 1983-December 1984,
S. Feldman, and F. Becker. Jan 85, 128p TE4367-24-85, GRI-85/0062
Contract GRI-5083-241-0853
See also PB81-181331.

With the introduction by Borg-Warner of the Heatpipe Furnace, one of the major goals of this program was achieved. This milestone was reached after a 105,000 Btu/hr, 85 percent efficient manufacturing prototype heat pipe furnace was designed, fabricated, and tested by Thermo Electron. Other prototype units of different capacities were also designed. The prototypes underwent extensive field testing and in-house accelerated life-cycle testing, indicating that they were reliable, safe, and cost-competitive. Specific issues like freeze protection and oil contamination were addressed. Two different prototype ultrahigh-efficiency condensing furnaces were designed, fabricated and tested. One approach utilized a fluorocarbon-filled heat pipe as a secondary-stage heat exchanger; the other used a plate finned tube coil as the heat exchanger.

536,235
PB85-200228/GAR PC **A04**/MF **A01**
Battelle Columbus Labs., OH.
Basic Research on Pulse-Combustion Phenomena. Annual Report November 1983-November 1984,
J. M. Corliss, and A. A. Putnam. 15 Apr 85, 82p GRI-85/0029
Contract GRI-5083-260-0864

The objective of this program is to study the basic fluid mechanics, kinetics, and pollutant formation phenomena occurring in pulse-combustion systems. To meet this objective, non-obstrusive optical diagnostic techniques are being employed in addition to more conventional combustion diagnostics. Two pulse combustor systems are described. One is constructed from steel tubing and is used for conventional diagnostic studies. The second pulse combustor is constructed from quartz tubing and is used for the optical diagnostics. Results of the experiments indicate that cyclic reignition in the combustion chamber occurs as a result of flame stabilization at the step expansion between the mixing chamber and the combustion process never ceases from cycle to cycle. The flame stabilization point that was discovered using the optical methods is also the highest temperature location in the system. This reinforces the concept of continuous combustion at this critical point in the combustor. Combustion is completed by the time the gases reach a point less than midway down the length of the combustion chamber. Gas temperatures vary several hundred degrees F in the combustion zone in phase with combustion chamber pressure. Fuel heating value, varied by nitrogen dilution of natural gas fuel, has a negligible impact on system performance. Fuel composition, varied by propane injection in natural gas, has a weak but measurable effect on system operation.

536,236
PB85-200285/GAR PC **A05**/MF **A01**
KVB, Inc., Irvine, CA.
Laboratory Evaluation of NO(sub X) Reduction Techniques for Refinery CO Boilers.
Final rept. Mar-Dec 83,
H. B. Lange, J. K. Arand, M. N. Mansour, and S. C. Hunter. Apr 85, 81p KVB72-806034-1948, EPA/600/7-85/017
Contract EPA-68-02-3690

The report describes a laboratory test program to investigate NOx emissions from refinery CO boilers. The program had three major objectives: (1) to simulate in the laboratory a full-scale refinery CO boiler, (2) to investigate the effects of operational variables on NOx formation in the boiler furnace, and (3) to evaluate combustion modification techniques to reduce the NOx emissions. The laboratory model was shown to accurately represent combustion and NOx formation processes occurring in the full-scale boiler by comparing combustion products analyses over a range of operating conditions. The most significant operating variables influencing NOx formation in the CO boiler were found to be the ammonia level in the CO-gas and the burner stoichiometry. NOx reduction methods that were tested included combustion air staging, staged admission of fuel, fuel injection in the CO-gas, redesign of the fuel injectors, and burner throat redesign. The most effective NOx reduction technique was found to be combustion air staging. NOx formation in the CO boiler was reduced to zero (NOx emission equivalent to NOx entering with CO-gas) in the laboratory while maintaining acceptable (<200 ppm) CO levels in the stack gas. While zero NOx formation will probably not be achievable in the field, substantial NOx reductions should be achievable under practical operating conditions.

13B. Civil Engineering

536,237
AD-A153 500/4/GAR PC **A08**/MF **A01**
Army Engineer District, Charleston, SC.
Detailed Project Report and Environmental Assessment, Wilson Branch, Chesterfield County, South Carolina. Revision.
27 Aug 82, 160p
Revision of report dated Jun 82, AD-A132 432.

The recommended plan of improvement for Wilson Branch consists of demolishing six houses which lie below the 10-year flood plain on Wilson Branch. These six adjacent houses lie in a reach from 500 to 1500 feet from the mouth of Wilson Branch. All disturbed areas would be planted with grass, shrubs and trees to prevent erosion and to restore a natural appearance. Project lands would be obtained and controlled by the local project sponsor for maintenance purposes. Local project sponsors must also enforce flood plain ordinances to assure that any future development of the residual flood plain would be compatible with the flood hazard. Estimated first cost for implementation of the recommended plan is $314,590 plus an additional $120,000 in related cost for the relocation of current occupants of affected flood plain structures. Average annual project benefits resulting from the implementation of the recommended plan of improvement are estimated to be $27,440 in flood damage reduction benefits to existing development.

536,238
AD-A153 661/4/GAR PC **A03**/MF **A01**
Army Engineer District, Charleston, SC.
Camp Branch/Lynches Lake, Lake City, Florence County, South Carolina.
Reconnaissance rept.
Aug 83, 40p

Several alternative measures to meet the problems and needs of the area are possible; however, some of these measures are not practical or economical. Possible solutions may be divided into two broad categories of structural and nonstructural. Structural measures are designed to modify floods by altering the natural environment. These measures include alternatives which reduce flood elevations, divert floods, change the timing and duration of floods or restrict floods from portions of the flood plain. Nonstructural measures are designed to modify flood damage susceptibility and include modifications to the cultural environment by adjustment in the pattern and mode of land use, by developmental policies and by assistance to affected individuals. Also, a combination of structural and nonstructural measures is possible. Based upon information presented in this report, it is recommended that further study of flood problems in Camp Branch/Lynches Lake be authorized. Estimated study cost for completion of an expanded reconnaissance report is $114,800.

536,239
AD-A153 708/3/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Water Support during War,
L. P. Marlin, H. R. Moss, and W. A. Nichols. Mar 84, 14p AFLMC-821003, SBI-AD-F630 675

Wartime water needs for all geographic locations were analyzed with emphasis placed on living within the JCS planning factors. We found that present planning factors are well documented and supported, but not contained in Air Force publications. We also developed some logistics only planning factors not previously considered. Our review encompassed fixed plant and mobile water purification systems. In reviewing waterless decontamination procedures, we discovered a commercially developed dry cleaning system which offers great promise for decontaminating without water. The report offers four recommendations: (1) include newly developed 'logistics only' water needs in the JCS planning factors, (2) include JCS planning factors in Air Force WMP 1, (3) continue to investigate a Freon-based decontamination unit, (4) ensure a newly developed NBC detection kit enters the Air Force without delay.

536,240
AD-A153 813/1/GAR PC **A03**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Hydraulics Lab.
Environmental and Water Quality Operational Studies. Reaeration at Navigation Locks.
Final technical rept.,
S. C. Wilhelms. Jan 85, 35p Rept no. WES/TR/E-85-1

Gas transfer at several Corps of Engineers navigation locks was evaluated relative to effects on downstream dissolved oxygen and dissolved nitrogen concentrations. In-lock measurements indicated that very little oxygen up-take occurred during lock filling. Measurements of dissolved oxygen in the release water indicated that, in general, lock releases improve or maintain existing downstream water quality. At some locks

where the downstream bulk-head slots were open to the atmosphere, significant air entrainment occurred downstream of the emptying valve during releases. The air and water mixture and hydraulic conditions in the downstream release conduits caused significant oxygen uptake and even oxygen supersaturation. Simultaneously, nitrogen supersaturation occurred but at levels that did not appear to be detrimental to aquatic biota.

536,241
AD-A153 847/9/GAR PC A05/MF A01
Coastal Engineering Research Center, Vicksburg, MS.
Water Wave Refraction/Diffraction/Shoaling Investigation, Crescent City, California.
Final rept.,
L. Z. Hales. Mar 85, 100p Rept no. CERC-85-3

Because of inherent questions regarding the stability of various construction elements used in the original design and rehabilitation, and because of uncertainties which exist regarding the actual prototype wave climate existing at the damaged section of the breakwater, a detailed refraction/diffraction/shoaling analysis was made prior to the initiation of necessary breakwater repairs. This investigation was conducted by using a state-of-the-art numerical model (RCPWAVE) for describing nearshore wave transformation by underwater bathymetry. Results of this numerical investigation will be used to determine the design wave height for the breakwater repair at the damaged dolosse section, and this wave height also wil be used by WES in a physical model stability investigation of the rehabilitated breakwater. Originator-supplied keywords: Breakwaters, Breaking waves, Diffraction, Jetties, Numerical models, Physical models, Refraction, Shoaling, Water waves, Wave heights.

536,242
AD-A153 981/6/GAR PC A11/MF A01
Army Engineer District, Charleston, SC.
Sugar Creek Basin North Carolina and South Carolina, Feasibility Report and Environmental Impact Statement for Water Resources Development.
Final rept.
Oct 82, 243p

Report of investigations to determine feasibility of providing flood control and related water resource improvements on various streams within the Sugar Creek Basin, North Carolina and South Carolina. The report recommends construction of a combination of structural and non-structural flood damage prevention measures and discusses the impacts of implementation.

536,243
AD-A153 983/2/GAR PC A03/MF A01
Environmental Research Lab., Gulf Breeze, FL.
Evaluation of Three Fish Species as Bioassay Organisms for Dredged Material Testing.
Final rept.,
N. I. Rubinstein, W. T. Gilliam, and N. R. Gregory.
Dec 84, 27p EPA-600/X-83-062, WES-MP-D-84-1
Contract AR-21-F-2-5770

Three fish species, Cyprinodon variegatus, Fundulus similis, and Menidia menidia, were evaluated to determine which is most suitable as a bioassay organism for solid phase testing of dredged material. Acute toxicity and bioaccumulation of polychlorinated biphenyls (PCBs) were monitored for 52 days of exposure to two types of dredged material collected from the New York harbor. Cyprinodon variegatus displayed the most consistent accumulation of PCBs. However, no definition statement can be made regarding acute toxicity response because of poor control survival, Review of the literature indicates the M. menidia is the most sensitive of the three species examined and, consequently, it is felt that this species should be strongly considered as a candidate for solid testing. Originator supplied keywords: Biological assay, Dredged material, Fishes, Effect of water pollution on, Pollution--Research, Water--Pollution--Environmental aspects.

536,244
DE84901494/GAR PC A03/MF A01
Queen's Univ., Kingston (Ontario).
Elutriation Rates from Fluidized Bed Combustors and from Cold Fluidized Beds of FBC Product Particles.
B. S. Xu, H. A. Becker, and R. K. Code. 1985, 49p NP-4901494
Technical report QFBC.TR.83.2.
U.S. Sales Only.

Particle elutriation rates were measured in pilot plant trials on the combustion of high-sulphur coal with limestone addition for sulphur capture. A cold-modelling version was also built with which elutriation was studied over a broad range of operating conditions using spent bed material from the pilot plant trials. Attention is particularly focussed on the division of the solids leaving flux between elutriated particles and bed product. For a given particle diameter D/sub p/, this division appears to be determined primarily by the ratio D/sub p//v exp 1 . exp 163 , where v is the fluidizing velocity, and by the recycle level. A generalized correlation of the results is suggested. 21 references, 2 tables, 15 figures. (ERA citation 10:022355)

536,245
DE84901605/GAR PC A13/MF A01
Queen's Univ., Kingston (Ontario).
Pilot Scale Trials on Atmospheric Fluidized Bed Combustion of High-Sulphur Eastern Canadian Coals (Minto and Devco) with Limestone Addition for Sulphur Capture. Final Report.
H. A. Becker, R. K. Code, and J. T. N. Atkinson.
1983, 291p NP-4901605
U.S. Sales Only.

Combustion of high-sulfur eastern Canadian coals (Minto and Devco, respectively 7.4% and 5.4% S) with addition of an eastern Canadian limestone (Havelock) for sulfur capture has been studied in a pilot-scale atmospheric fluidized bed combustion (AFBC) system. The combustion chamber is of square cross-section, 0.155 m exp 2 in area, and 3.3 m high. Operating conditions were: mean coal particle size 6.6 to 19.3 mm, mean limestone particle size 0.49 to 1.96 mm, coal feedrate 26 to 50 kg/m exp 2 hr, Ca/S molar ratio 1.4 to 4.5, excess air level - 20 to 44%, bed temperature 800 to 960 exp 0 C, fluidizing velocity 1.6 to 2.9 m/s, and cyclone dust recycle 0 to 100%. Both coals burned well. Carbon burnups were 88.5 to 97.5% of the fuel carbon. An empirical correlation relates carbon loss to fluidizing velocity, limestone particle diameter, excess air level, bed temperature, and recycle level. Havelock limestone (97% CaCO sub 3) is a fairly good SO sub 2 sorbent; 90% sulfur capture is achieved with a Ca/S ratio of 2.8 using stone of mean particle size under 1 mm, and 98% at a ratio of 3.6. Only 9 to 24% of the fuel nitrogen appears as NO/sub x/, the rest being presumably converted to N sub 2 . The partition of the solid products between bed product, cyclone product (dust not recycled), and baghouse product is determined principally by the recycle level. Other results presented include: heat transfer coefficients to in-bed tubes, freeboard burning and freeboard NO/sub x/ reduction, phenomena and characteristics of transient response and statistically stationary fluctuations, mineral element balances (Ca, Mg, Fe, Si, Na, K, V), and fluidization parameters. 15 references. (ERA citation 10:019868)

536,246
DE85008356/GAR PC A02/MF A01
Oak Ridge National Lab., TN.
Program Planning Using the GMAP Procedure in SAS/GRAPH Software.
T. R. Nelson, M. P. Farrell, T. J. Gross, and T. R. White. 1985, 11p CONF-8503114-2
Contract AC05-84OR21400
SUGI/SAS Users Group international conference, Reno, NV, USA, 10 Mar 1985.
Portions of this document are illegible in microfiche products.

A methodology that produces Program Planning Charts using SAS/GRAPH software has been developed as an aid to program management in the CO sub 2 Research Program of the US Department of Energy. The methodology uses programs from MAPPER, a front-end program (written by D.A. Dahl) for DISSPLA to produce Logic Flow diagrams. Each research question, or set of questions, which comprise one phase of a research program, is represented by a boxed area containing the title of the particular research question(s). The GMAP procedure of SAS/GRAPH software reads user-supplied information regarding a variable aspect of each research question and shades the boxes accordingly. The result is a color-coded planning chart depicting the user supplied information for the individual research questions and, consequently, the status of the overall program. 4 figures, 1 table. (ERA citation 10:023067)

536,247
DE85008842/GAR PC A10/MF A01
Bonneville Power Administration, Portland, OR.
Crow Butte Slough Crossing: Study Documentation Report. Supplement to Final EIS, Ashe-Slatt (Pebble Springs) 500-KV Transmission Line.
Sep 81, 219p DOE/EIS-0077-SDR
Portions of this document are illegible in microfiche products.

This report is the technical appendix to the Bonneville Power Administration (BPA) Draft Environmental Impact Statement (EIS) Supplement to the Final EIS for the Ashe-Slatt 500-kV transmission line (BPA, 1975). The Final EIS was filed with the Environmental Protection Agency in September of 1975. This report contains the data and methodologies which were used to identify, quantify, analyze, and evaluate the potential environmental impacts associated with the various alternatives under consideration for the Crow Butte transmission line crossing. (ERA citation 10:023097)

536,248
DE85008871/GAR PC A07/MF A01
Bonneville Power Administration, Portland, OR.
Crow Butte Slough Crossing. Supplement to Final EIS, Ashe-Slatt (Pebble Springs) 500-KV Transmission Line.
Sep 81, 133p DOE/EIS-0077-DS

The proposed action is to construct a 4700-ft segment of the Ashe-Slatt transmission line at Crow Butte Slough, overhead on towers on the existing right-of-way. Alternatives to the proposal include undergrounding the line on the right-of-way or on an existing causeway off the right-of-way, and no action (removing an existing temporary overhead line). The proposed action will result in: temporary disruption (along the right-of-way) and/or destruction (at tower sites) of the habitat, including a wetlands area, and localized noise during construction; both direct (aesthetic) and indirect (recreational) visual effects of the towers and lines, some waterfowl mortality from in-flight collisions, possible corona noise or electric/magnetic effects on some animals, and vegetative control by minor herbicide use during operation. Underground alternatives on the right-of-way cause greater temporary disruption and/or destruction of the habitat, temporary deterioration of the water quality, and possible interference with access to the Crow Butte State Park during construction; terminal station visibility, and possible impacts from accidental chemical (dielectric fluid) releases, from minor uses of herbicides, from cable heat on revegetation, or from cooling station noise to animals during operation. (ERA citation 10:023096)

536,249
DE85009343/GAR PC A05/MF A01
Montana Dept. of Natural Resources and Conservation, Helena.
Hunter Survey Final Report, Phase 1 - Baseline Study. Garrison-Spokane 500-KV Transmission Project.
S. Allen. Nov 84, 92p DOE/BP-16380-1
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

The State of Montana, in cooperation with the US Forest Service and the Bonneville Power Administration, is conducting a five-year study on the impacts on elk security habitat and hunter opportunity in western Montana of a 500 kV transmission line. Potential impacts stem from the new and upgraded access roads required for the line, which may reduce summer/fall security habitat and make hunting areas less remote. The line itself could affect the aesthetics of popular hunting areas located along the route. As part of this monitoring program, the Montana Department of Natural Resources and Conservation is surveying hunters at seven check stations in the project's two study areas. The hunter survey research has three phases. Phase I was conducted in fall, 1983, to collect baseline data on hunting use and quality in the study areas. After the line is constructed and energized, the Phase II survey, scheduled for fall, 1985, will test hypotheses developed from baseline data to assess the project's impacts on hunting use. During Phase III, scheduled for fall, 1986, the persistence of any impacts identified will be measured. Reports from each phase will be issued to the Interagency Wildlife Technical Committee (chaired by the Bonneville Power Administration). The data will also be used by the Montana Department of Fish, Wildlife, and Parks, both to help manage elk and to assist in US Forest Service Land management planning. Over 600 hunters were interviewed using a

questionnaire developed by DNRC and reviewed extensively by state and federal agencies. The survey form contained questions on hunters' reasons for choosing the study areas as places to hunt, hunting success and related information, previous hunting experience, hunting area evaluations, place of residence, and age. The data were tabulated to describe the 1983 baseline data, and then subjected to cluster analysis. 36 references, 1 figure, 9 tables. (ERA citation 10:023103)

536,250
DE85009784/GAR PC **A02**/MF **A01**
North Dakota Univ., Grand Forks. Energy Research Center.
Pilot-Scale Treatment and Cooling Tower Reuse of Gasification Wastewater.
S. J. Galegher, M. D. Mann, W. G. Willson, G. G. Mayer, and J. G. Hendrikson. Mar 85, 13p DOE/FE/60181-132, CONF-850427-1
Contract FC21-83FE60181
Western synfuels symposium, Grand Junction, CO, USA, 24 Apr 1985.

The principal goal of the gasification research program at the University of North Dakota Energy Research Center (UNDERC) is to develop environmental data for effluent streams for fixed-bed gasification processes using low rank coals (LRC). Current efforts involve the treatment of gas liquor wastewater streams, and subsequent reuse in process cooling towers. The relatively large volume of wastewater produced in the fixed-bed gasification of LRC's makes the reuse of this stream in an evaporative cooling tower a desirable approach. However, the use of gas liquor as cooling tower makeup presents both operating and environmental concerns. At UNDERC a series of cooling tower wastewater reuse tests have been performed using water pretreated to various degrees. Wastewater for each test was produced in a pilot slagging fixed-bed gasifier (SFBG) at UNDERC using North Dakota lignite from the Indian Head mine. During the first phase of testing SFBG wastewater was treated by solvent extraction and steam stripping, to reduce levels of phenolic compounds and ammonia, prior to use as makeup to a pilot mechanical draft cooling tower. In later tests, this extracted and stripped wastewater (SGL) was further treated by biological oxidation and by granular activated carbon adsorption in pilot equipment at UNDERC before being fed to the cooling tower. The final test in this series involved the use of this extensively treated wastewater with the addition of chemical corrosion and scale inhibitors as cooling tower makeup. High carbon steel corrosion rates, biological and organic fouling rates, foaming, and volatile organic stripping rates were observed in the test using stripped gas liquor from slagging fixed-bed gasification. (ERA citation 10:022278)

536,251
DE85009949/GAR PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Liquefied Gaseous Fuels Spill Test Facility: Facility Description.
G. W. Johnson, and D. S. Thompson. Dec 84, 50p UCID-20291
Contract W-7405-ENG-48

The Liquefied Gaseous Fuels Spill Test Facility being constructed at the Department of Energy's Nevada Test Site is proposed as the basic research tool for studying the dynamics of accidental releases of various hazardous liquids. This Facility is designed to discharge, at varying discharge rates, measured volumes of liquids that have been stored under cryogenic or ambient conditions onto the surface of a dry lake bed. Performance criteria have been established on the basis of discharges normally expected from transport or storage-type accidents. Facility capabilities include means for the remote control and measurement of test spill operating parameters and for the remote, unmanned acquisition and recording of close-in and downwind gaseous concentrations and meteorological data. 5 references, 17 figures, 5 tables. (ERA citation 10:022392)

536,252
DE85780301/GAR PC **A21**/MF **A01**
Karlsruhe Univ. (Germany, F.R.). Projektgruppe Techno-Oekonomie und Umweltschutz.
Consideration of Environmental Pollution in MESSAGE-Type Energy Models.
O. Rentz, T. Hanicke, and R. Hempelmann. Oct 81, 494p INIS-mf-8896
In German.
U.S. Sales Only.

Macroeconomic and microeconomic data are acquired and processed to obtain a model-adequate data base. The MESSAGE model is adapted and implemented. Modifications for specific problems are described. Aspects of environmental pollution are considered for the various energy supply concepts. The model conception is flexible with regard to new technologies, in particular in the field of primary and secondary energy sources, and to cogeneration products (district heat, electric power). (Atomindex citation 15:057003)

536,253
DE85780603/GAR PC **A14**/MF **A01**
Deutscher Bundestag, Bonn (Germany, F.R.). Hauptabteilung Wissenschaftliche Dienste.
Environmental Policy in the 9TH German Bundestag and the Bundesrat (1980-1983).
Jun 83, 310p INIS-mf-9207
In German.
U.S. Sales Only.

This presentation of environmental policy constitutes the continuation of copies No. 49 and No. 72 of the 'Materialien' (Materials) (Environmental policy in the 7th German Bundestag or environmental policy in the 8. German Bundestag and in the Bundesrat, resp. - 1976 to 1980). References to factual terms espec. indications of speech references, apply to the register annexed to 'Verhandlungen des Deutschen Bundestages und des Bundesrates' (Deliberations of the German Bundestag and the Bundesrat) for the 9th period of office on which the 'Materialie' is based. Among other things, the 'Materialie' comprises: General fundamentals and primaples, aspects of structural policy, scientific and technical/technological fundamentals, organizational fundamentals, international and intergovernmental co-operation, air-borne emission abatement, waste management, chemical substances released to environment, nuclear energy. (Atomindex citation 15:068583)

536,254
PB85-172682/GAR PC **A07**/MF **A01**
Environmental Protection Agency, Washington, DC.
Needs Survey Report to Congress, 1984: Assessment of Needed Publicly Owned Wastewater Treatment Facilities in the United States,
J. W. Byron, W. Huang, M. Cullen, and K. Klima. 10 Feb 85, 129p EPA/430/9-84/011, EPA/DF-85/005A
For system on magnetic tape, see PB85-172690. Prepared in cooperation with Weston (Roy F.), Inc., West Chester, PA.

The 1984 Needs Survey Report summarizes a 2-year data collection effort. This Report includes costs for building grant eligible municipally-owned treatment facilities for the current (1984) population when all identified year 2000 needs are met. The Report also contains national summaries of technical information collected during the Survey. Examples of the technical information are: number of treatment plants now and in year 2000; number of nondischarging treatment plants; summary of treatment plant unit processes.

536,255
PB85-172690/GAR CP **T03**
Environmental Protection Agency, Washington, DC.
Needs Survey Report to Congress, 1984: Assessment of Needed Publicly Owned Wastewater Treatment Facilities in the United States.
Data file,
M. J. Cullen, W. H. Huang, J. W. Byron, and W. Savich. 1985, mag tape EPA/DF-85/005
Source tape is in the EBCDIC character set. This restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation PB85-172682.

The 1984 Needs Survey Report summarizes a 2-year data collection effort. This Report also contains national summaries of technical information collected during the Survey. Examples of the technical information are: number of treatment plants now and in year 2000; number of nondischarging treatment plants; summary of treatment plant unit processes. The tape contains all the raw data used for the summary report.

536,256
PB85-180065/GAR PC **E06**/MF **E06**
Water Research Centre, Stevenage (England).
Biological Filtration of Finely-Screened Sewage.
Technical rept.,
G. Hoyland, and D. Roland. c1984, 43p TR-198

The cost of treating and disposing of sludge solids produced at sewage treatment works amounts typically to about 45% of the total cost of running the works. To reduce sludge costs, a recent trend in works design has been to omit primary sedimentation and, instead, biologically oxidise the settleable solids thereby reducing their production. To date, this treatment method has been successfully applied on an operational scale only at activated-sludge works, because conventional biological filters and distributors cannot be heavily loaded with solids without blocking. Filtration of unsettled sewage is, however, economically attractive because the oxygen consumed in destroying the solids is provided by natural convection - free of charge. A pilot-scale filtration plant designed to treat unsettled sewage has been evaluated. The sewage was finely-screened through 1.5 mm wide apertures, to remove only the large and presumably least biodegradable particles, before treatment in filters containing high-voltage plastic elements. A self-cleansing distributor spread the finely-screened sewage evenly over the filter's surface. (Copyright (c) Water Research Centre, 1984.)

536,257
PB85-180099/GAR PC **E06**/MF **E06**
Water Research Centre, Stevenage (England).
United Kingdom Water Quality Standards Arising from European Community Directives.
Technical rept.,
J. Gardiner, and G. Mance. c1984, 47p TR-204

The main purpose of this report is to tabulate water quality standards defined by, or arising from, directives agreed by the Council of European Communities, and to summarize the text of each directive. The Official Journal of the European Communities in which these directives are published is not readily available and the important provisions they contain are not widely known, except at higher levels of the water industry. There are now five directives dealing with quality of water for human consumption, for abstraction to public supply, for bathing and for the support of freshwater fish, and shellfish. All of these directives define water quality standards. Stipulations on monitoring programs and details of analytical methods to be employed may also be given in the directives, or are published in subsidiary directives. (Copyright (c) Water Research Centre, 1984.)

536,258
PB85-180909/GAR PC **A18**/MF **A01**
Metropolitan Transit Authority of Harris County, Houston, TX.
Bus Service Evaluation Methods: A Review, Update to 1979 Edition.
Rept. for 1979-84.
Nov 84, 419p DOT-I-84-49
See also PB-296 314. Sponsored by Urban Mass Transportation Administration, Washington, DC.

This report is a comprehensive review of service evaluation procedures used by transit agencies of various sizes. The document reviews the service evaluation practices of 109 separate transit agencies in the United States and Canada. Included for each system are a description of the system itself, a review of the evaluation procedures it uses, the property's view of the effectiveness of the indicators used, and a summary of the actual criteria it utilizes.

536,259
PB85-182616/GAR PC **A03**/MF **A01**
Lenox Inst. for Research, Inc., MA.
Startup and Continuous Operation of Lenox Water Treatment Plant, Lenox, Massachusetts.
Technical rept. May-Jun 82,
M. Krofta, and L. K. Wang. 22 Jun 82, 34p LIR/06-82/1
Sponsored by Krofta Engineering Corp., Lenox, MA. Prepared in cooperation with Massachusetts Univ., Amherst and Tri-Town Health Dept., Lee, MA.

The first full-scale flotation plant has been constructed for potable water treatment in Lenox, Massachusetts, U.S.A. at a rated design capacity of one million gallons per day. The plant includes chemical feeding, flocculation, dissolved air flotation and disinfection. This report documents the data on startup and continuous operation of Lenox Plant, covering the period of May, 10 -

June 22, 1982. Operation alternatives, schedule, chemical treatment, and polyelectrolyte determination procedures are also documented.

536,260
PB85-183036/GAR PC A13/MF A01
Purdue Univ., Lafayette, IN. School of Civil Engineering.
Development and Use of a Management Information System to Identify Areas of Routine Maintenance Productivity Improvement.
Interim rept.,
V. A. Sanderson, and K. C. Sinha. 3 Jul 84, 283p
FHWA/IN/JHRP-84/11
Sponsored by Indiana Dept. of Highways, Indianapolis.Portions of this document are not fully legible.

This report presents the development of a monitoring procedure that can provide the maintenance managers of the Indiana Department of Highways with a relatively simple and straight-forward base for evaluating and improving productivity of maintenance operations. The procedure involves calculation of average cost of performing a given maintenance activity to identify 'deviate' subdistricts (those with very high or low costs), analysis of labor and material use information, review of equipment records, and field observations of crews at work in order to determine the reasons for the deviate cost.

536,261
PB85-183044/GAR PC A16/MF A01
Ames, IA.
Co-Firing of Solid Wastes and Coal at Ames: Pulverized Coal,
A. W. Joensen, J. L. Hall, J. C. Even, D. Van Meter, and P. Ghereaus. Mar 85, 351p EPA/600/2-85/031
Grant EPA-R-803903
Prepared in cooperation with Iowa State Univ., Ames. Engineering Research Inst., and Midwest Research Inst., Kansas City, MO.

This report presents an evaluation of the Ames Solid Waste Recovery System through the third full year of its operation (1978). This evaluation includes the operating experience and economics of the refuse processing plant, the characterization of the various material flow streams within the refuse processing plant, and the thermodynamic and mechanical performance and the environmental emissions of the 35 MW suspension fired steam generator modified by a dumpgrate installation.

536,262
PB85-183788/GAR PC A03/MF A01
Atlantic Research Corp., Alexandria, VA.
Automatic Audio Signing. Volume 1. Executive Summary.
Final rept. on Phase 3, Aug 82-83,
H. C. Turnage, and R. C. Hawthorne. Jun 84, 31p
FHWA/RD-84-038
Contract DTFH61-80-C-00177
See also PB85-183796.

This report summarizes the findings and recommendations of a project directed toward the development of an automatic audio signing system. Also referred to as 'Automatic Highway Advisory Radio' (AHAR), its objective is to facilitate aural roadside-to-motorist communications without diverting the motorist's attention from the task of driving. The prototype equipment developed and produced for a pilot demonstration of the concept is briefly described. Planning for the demonstration and the results of the actual demonstration conducted in the Tampa/St. Petersburg area of Florida are covered. Results, conclusions and recommendations are discussed in the final section.

536,263
PB85-183796/GAR PC A05/MF A01
Atlantic Research Corp., Alexandria, VA.
Automatic Audio Signing. Volume 2. Prototype Development and Prototype Pilot Demonstration Program.
Final rept. on Phase 3, Aug 82-83,
H. C. Turnage, R. C. Hawthorne, and M. C. L. Birdseye. Jun 84, 95p FHWA/RD-84-039
Contract DTFH61-80-C-00177
See also PB85-183788.

This report documents the activities, findings and recommendations of a project directed toward the development of an automatic audio signing system. Also referred to as 'Automatic Highway Advisory Radio' (AHAR), its objective is to facilitate aural roadside-to-motorist communications without diverting the motorist's attention from the task of driving. The prototype hardware and software developed for a pilot demonstration is described. The conduct of the pilot demonstration is described and the results, conclusions and recommendations are discussed.

536,264
PB85-183960/GAR PC A03/MF A01
Soil Conservation Service, Washington, DC. Engineering Div.
Hydraulic Proportioning of Two-Way Covered Baffle Inlet Riser.
Final rept.,
R. A. Fronk. Sep 83, 27p SCS/ENG/TR-70

This technical release (TR) presents criteria for the design and the structural layout proportioning for the two-way baffle inlet on a covered riser. The baffle inlet was developed to overcome the limitation of the standard covered riser that does not permit encroachment of the ground surface, embankment or sediment pool, into the area of the trashrack below the weir crest. Numerous variations of the concept have been tested at the SEA-AR Hydraulic Laboratory at Stillwater, Oklahoma. Model and prototype test and field observations of actual installations of baffle inlets have demonstrated that they function well.

536,265
PB85-184141/GAR PC A08/MF A01
Leisch (Jack E.) and Associates, Evanston, IL.
Procedure for Analysis and Design of Weaving Sections. Volume 1. Research Findings and Development of Techniques for Application.
Final rept.,
J. E. Leisch, and J. P. Leisch. Dec 83, 172p FHWA/RD-85/072
Contract DTFH61-82-C-00050
See also Volume 2, PB85-184158.

This research was performed to complete and advance the status of recently developed procedures for analysis and design of weaving sections (known as the Leisch method). The objective was to enlarge upon and complete the earlier work through calibration of the method by using data from the Bureau of Public Roads (BPR) Weaving Area Study, NCHRP Project 3-15, and studies of Institute for Research of Pennsylvania State College; also to expand and refine the initial statistical analysis to provide full documentation; as well as to update the nomographs previously developed, including a demonstration of problem solutions for application. The research and development conducted closely verified the previous work, and largely expanded on documentation and application of the procedure. The report is presented in two parts. Volume 1 covers the development and verification of the procedure.

536,266
PB85-184158/GAR PC A05/MF A01
Leisch (Jack E.) and Associates, Evanston, IL.
Procedure for Analysis and Design of Weaving Sections. Volume 2. Users Guide.
Final rept.,
J. E. Leisch, and J. P. Leisch. Feb 84, 77p FHWA/RD-85/073
Contract DTFH61-82-C-00050
See also Volume 1, PB85-184141.

This research was performed to complete and advance the status of recently developed procedures for analysis and design of weaving sections (known as the Leisch method). Volume 2 provides a users guide to demonstrate the solution of a variety of weaving problems, encompassing a full spectrum of applications.

536,267
PB85-184372/GAR PC A03/MF A01
Midwest Pavement Management, Inc., St. Paul, MN.
Surface Condition Rating System: Field Guide,
M. M. Marti, and E. L. Skok. Sep 84, 42p
Also pub. as Minnesota Dept. of Transportation, St. Paul investigation no. 645.

This summary report is an illustrated description of a surface condition rating procedure for flexible pavements. A slide tape presentation has also been prepared on this subject. This report and the slide tape can be used together to supplement each other, and the report can be used as a reference during field condition surveys. Both documents are intended to be training aids for people who are responsible for evaluating pavement conditions and selecting appropriate maintenance procedures. With ratings of surface condition determined on the pavements in a road system it is possible to set up a program of immediate and future needs for some type of pavement improvement.

536,268
PB85-185171/GAR PC A03/MF A01
Soil Conservation Service, Washington, DC. Engineering Div.
Ground-Water Recharge.
Final rept.
Jun 67, 26p SCS/ENG/TR-36

The purpose of this technical release is to provide information on general procedures and methods for artificial groundwater recharge to aquifers. Emphasis is placed on the conservation and use of excess runoff where there are possibilities for increased underground storage. Factors pertaining to local and state groundwater laws are considered. Conditions most favorable for natural or artificial recharge are described. Methods for improving the rates and amounts of recharge to an aquifer are presented. Eight important factors are discussed that must be considered when selecting a location for artificial recharge. Illustrated examples of hydrogeological situations that may be conducive to groundwater recharge are shown. Land treatment methods and structural measures for improving groundwater recharge are discussed, including incidental recharge from reservoirs and water spreading techniques.

536,269
PB85-185502/GAR PC A04/MF A01
New Jersey Dept. of Transportation, Trenton.
Operational Effects of Right Turn on Red in New Jersey.
Final rept. May 78-Apr 84,
W. L. Mullowney, and T. D. Davis. Apr 84, 74p
REPT-84-010-7782, FHWA/NJ-84/010

This study was conducted to measure the effects Right Turn on Red (RTOR) had on delay and accidents at signalized intersections in New Jersey. The accidents were studied by comparing the change in accidents at test intersections which allowed RTOR at all approaches with the change in accidents at control intersections which prohibited RTOR. RTOR caused a significant increase in accidents at intersections which involved a state highway. During the period 1978-1981, approximately 3,000 accidents/year were caused by the allowance of RTOR. No change in accidents was found at intersections involving only county and/or local roads over the same time period.

536,270
PB85-185759/GAR PC A04/MF A01
Arizona Univ., Tucson. School of Renewable Natural Resources.
Comprehensive Planning for Strip Mining Reclamation in Dry Regions with Emphasis on Water Harvesting.
Open file rept.,
J. L. Thames. Sep 84, 64p BUMINES-OFR-23-85
Contract J0205042

The benefits of water harvesting as an alternative to conventional reclamation were demonstrated on the Peabody Coal mines in northeast Arizona. The project produced food crops for 4 years and demonstrated that a catchment and crop area ratio of about 2.5:1 was sufficient to obtain sufficient water from the 11-in annual precipitation to produce garden and fruit varieties in quantities equal to or exceeding national production averages. The economic returns exceeded those of the conventional practice of returning the mine area to rangeland by at least tenfold. Subsidence of the regraded spoil was the only major problem in maintaining the system. Although, water harvesting benefits, as demonstrated by this project, they are presently at variance with strip mining regulations.

536,271
PB85-185825/GAR PC A14/MF A01
Dames and Moore, Los Angeles, CA.

Summary of Effects of Partially-Treated Sewage on Nearshore Environments of Southeastern Florida.
D. R. Young. Apr 85, 301p EPA/600/3-85/020
Grant EPA-R-806307, Contract EPA-68-03-1706

This project consisted of two simultaneous phases. One phase was the construction and preliminary application of a prototype, experimental wastewater treatment seawater aquaria research facility. This facility, the Sewage Treatment and Bioeffects Laboratory (STABEL), was designed to replicate, as closely as possible the wastewater treatment process, the outfall disposal method, and the surrounding marine environment found along the southeast coast of Florida. The other phase was the collection of field data for the establishment of operating parameters, comparison data and baseline information, so that a context for the interpretation of experimental results could be developed. This included the collection of operating parameters and data from the largest sewage treatment plant discharging wastewater to the study area.

536,272
PB85-185882/GAR PC **A03/MF A01**
Environmental Protection Agency, Ann Arbor, MI. Test and Evaluation Branch.
Effect of Evaporative Canister Removal and Reid Vapor Pressure on Hydrocarbon Evaporative Emissions.
Technical rept.,
W. M. Pidgeon. Sep 84, 28p EPA/AA/TEB-84/04

This report presents the results of a test program designed to quantify the change in the evaporative hydrocarbon emissions of six vehicles that (1) were tested before and after their carbon canisters were removed, and (2) were tested with the normal Certification test gasoline (Indolene unleaded) which is low in volatility, and a commercial gasoline of high volatility. The two fuels were used with the carbon canisters installed and with the carbon canisters removed. The test vehicle model years ranged from 1974 to 1983. When tested with Indolene gasoline, the diurnal and hot soak evaporative hydrocarbon emissions of all six vehicles increased when the carbon canisters were removed, but the increases varied widely from vehicle to vehicle. When tested with commercial gasoline, the hot soak evaporative hydrocarbon emissions of four of the six vehicles increased when the carbon canisters were removed, but again, the increases varied widely from vehicle to vehicle. The hot soak evaporative emissions of the other two vehicles did not significantly change. The diurnal evaporative emissions of all six vehicles increased when the carbon canisters were removed. The evaporative emissions of all six vehicles increased when the low volatility Indolene unleade was replaced with the high volatility commercial gasoline.

536,273
PB85-186013/GAR PC **A06/MF A01**
Texas Transportation Inst., College Station.
Travel Information Data Aquisition System (TRIDAQS) Reference Manual.
Interim rept. Sep 80-Aug 83,
C. W. Blumentritt. Dec 83, 118p TTI-2-18-81-290-3, FHWA/TX-84/60+290-3
Sponsored by Texas State Dept. of Highways and Public Transportation, Austin.

The B-2 TRIDAQS (Travel Information Data Acquisition System) is a unit for recording travel time information in a floating vehicle. The unit is highly portable, with easy transfer from vehicle-to-vehicle, and virtually independent of any special equipment installations that would limit the use of the unit to a specific vehicle. The unit is easily operated by the driver, with the acquired data recorded on cassette tape. A playback arrangement within the unit permits recorded data to be transmitted directly to the computer for processing, utilizing an acoustic coupler and telephone hookup. This report is a revised users manual for the equipment.

536,274
PB85-186252/GAR PC **A03/MF A01**
Agricultural Research Service, Beltsville, MD.
Open Channel Junctions with Supercritical Flow,
C. E. Rice. Jan 85, 33p ARS-14

The publication contains the results of preliminary tests using small-scale models to obtain information for the design of channel junctions for supercritical flows in rectangular junctions. A combination of many variables were tested, the most important of which were the upstream channel to lateral channel flow combinations, the upstream main channel to downstream channel width ratio, and the intersection angles illustrations showing the various combinations of variables studied are included. The findings provide direction for future model studies with supercritical flows in open channel junctions.

536,275
PB85-186633/GAR PC **A18/MF A01**
WAPORA, Inc., Chevy Chase, MD.
Draft Environmental Impact Statement: Proposed Wastewater Treatment Facilities for Eastern St. Charles County, Missouri Including Duckett Creek Sewer District, St. Peters Sewer District, St. Charles Sewer District, Portage de Sioux Sewer District.
Mar 85, 404p EPA/907/9-85/001
Contract EPA-68-01-6609

The draft environmental impact statement addresses the social, economic, and environmental impacts potentially resulting from the proposed Federal action of issuing a grant for construction of wastewater management facilities within the St. Charles County facilities planning area. The planning area includes the Duckett Creek Sewer District and the cities of St. Charles and St. Peters, Missouri. Principal impact areas for the action alternatives include surface and groundwater quality, biological resources, and infrastructures. The recommended alternative was found to be environmentally sound and cost-effective. Most adverse impacts can be mitigated through various legal requirements, planning measures, and design/construction practices.

536,276
PB85-186856/GAR PC **A03/MF A01**
Soil Conservation Service, Washington, DC. Engineering Div.
Arkansas, December 1982: Spillway Performance Report (Revised).
Final rept.
Feb 84, 37p

This report describes the emergency spillway performance for the spillway flows which occurred in Arkansas in December 1982. The report discusses the storm, the reservoir flood routings, the hydraulics of the spillways, the damage at the individual sites, the geology and the soils at several sites, and the task group's observations.

536,277
PB85-186922/GAR PC **A14/MF A01**
Environmental Protection Agency, Chicago, IL. Region V.
Literature Review of Wetland Evaluation Methodologies.
Technical rept.
Sep 84, 318p
Prepared in cooperation with WAPORA, Inc., Chicago, IL.

This report reviews and summarizes (1) direct and cumulative impacts that may result from implementation of a wastewater treatment project facilities plan; (2) the available literature concerning methodologies that have been developed to evaluate wetland ecosystem baseline conditions; and (3) methodologies that assess impacts of various human activities on wetlands. Ultimately, this information will be used by USEPA to develop an objective impact screening methodology for use during the facilities planning process. Identification of potentially adverse impacts (red flags) would allow determination of issues that would lead to the requirement of more detailed, site-specific studies.

536,278
PB85-187714/GAR PC **A09/MF A01**
Soil Conservation Service, Washington, DC. Engineering Div.
National Engineering Handbook, Section 8. Engineering Geology.
Final rept.
May 78, 185p SCS/ENG/NEH-8
See also PB85-176204.

The purpose of this section of the engineering handbook is to present information on equipment, tools, exploration and sampling techniques, and criteria for conducting adequate investigations of damsites. It will also serve as a useful tool for training purposes, and to promote establishment of uniform standards and procedures for geologic investigations of damsites. Several factors necessary to satisfy design and construction requirements of a dam are discussed. Earth materials as an embankment are stressed. Emphasis is placed on particle characteristics, mass characteristics, and stratigraphic properties of embankment materials. The Unified Soil Classification System is examined. Classification of structure sites and minimum requirements for geologic investigations are presented.

536,279
PB85-187870/GAR PC **A04/MF A01**
Louisiana Dept. of Transportation and Development, Baton Rouge.
Evaluation of Skid Inventory Data for Development of Trends (Pilot Study) 82-1G(B).
Final rept. Jul 81-Jul 82,
W. C. Walters. Dec 83, 75p RR-169, FHWA/LA-83/169

This study examined historical data of the skid resistance inventory in Louisiana from 1974 through 1981 to determine trends. The data showed that no trend exists when using number of vehicle passes versus skid number difference on any surface presently used in Louisiana, i.e., on portland cement, bituminous concrete, or seal coat surfaces. A new method of skid resistance inventory using the Highway Performance Monitoring System recently instituted by the Louisiana Department of Transportation instead of the entire roadway network is suggested. It is anticipated that this method can be accomplished annually with the present resources.

536,280
PB85-188100/GAR PC **A06/MF A01**
Tennessee Univ., Knoxville. Transportation Center.
Use of Federal Formula Grants for Transit Operating Assistance in Smaller Urbanized Areas.
Final rept.,
D. P. Middendorf, and F. J. Wagmann. Mar 85, 105p UMTA-TN-11-0006-85-1
Grant DOT-UMTA-TN-11-0006

The objective of this study was to determine through case studies why some urbanized areas under 300,000 population have not used much of the Federal funding available to them for transit financial assistance.

536,281
PB85-188829/GAR PC **A06/MF A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS.
Settlement and Cover Subsidence of Hazardous Waste Landfills.
Final rept.,
W. L. Murphy, and P. A. Gilbert. Apr 85, 120p EPA/600/2-85/035

Numerical models using equations for linearly elastic deformation were developed to predict the maximum expected amount of settlement and cover subsidence and potential cracking of the cover by differential settlement in uniformly, horizontally layered hazardous waste landfills. The hazardous waste landfill models represented landfills in which unsaturated wastes were contained in steel drums that were assumed to deteriorate ultimately. The model landfill consisted of alternating layers of drummed wastes and intermediate clay cover. The maximum expected subsidence was calculated to be about 12% of the total landfill thickness.

536,282
PB85-188837/GAR PC **A07/MF A01**
Technical Resources, Inc., Bethesda, MD.
Assessment of PCDDs (Polychlorinated Dibenzodioxins) and PCDFs (Polychlorinated Dibenzofurans) from PCB (Polychlorinated Biphenyl's) Transformer and Capacitor Fires,
A. Lee. Apr 85, 130p EPA/600/2-85/036
Contract EPA-68-03-3212

The EPA, under the Toxic Substances Control Act, has been mandated to develop appropriate regulations for the control of exposure to polychlorinated biphenyls (PCBs). In light of this responsibility the EPA Office of Toxic Substances recently issued an Advance Notice of Proposed Rulemaking (ANPR) intended to define the problem of releases of PCBs and other toxic compounds during fires involving transformers and capacitors containing PCBs. The EPA Office of Research and Development (ORD) has also been mandated under

the recently released Dioxin Strategy document to evaluate fire accidents involving PCB transformers and capacitors as potential new sources of polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) in the environment. To develop the information to support the two mandated programs, the EPA/ORD undertook this study to assess the problems associated with fires involving askarels, to catalog the contamination experiences and to review potential decontamination methods as well as disposal of contaminated material. This study assesses the chemistry of PCBs under thermal conditions and evaluates the generation of PCDDs and PCDFs. It reviews technologies for destruction and disposal of PCBs and their toxic contaminants. Methodologies to assess potential hazards and reduce exposure are also discussed.

536,283
PB85-188845/GAR PC A09/MF A01
Colorado Univ. at Denver.
Risk Assessment of Wastewater Disinfection.
Rept. for Oct 79-Jan 84,
D. Hubly, W. Chappell, J. Lanning, M. Maltempo, and D. Chiras. Apr 85, 187p EPA/600/2-85/037
Grant EPA-R-806586

A risk assessment data base is presented for several waste-water disinfection alternatives, including chlorination, ozonation, chlorination/dechlorination, and ultraviolet radiation. The data base covers hazards and consequences related to onsite use and transportation of the disinfectants and ultimate disposal of disinfected effluents. A major segment of the data base deals with the effects of chlorination products in aquatic ecosystems. Energy consumption and cost analyses are also presented for chlorination and ozonation. Example risk calculations are presented for two hypothetical wastewater treatment plants. The usefulness of the data base for risk assessment is also discussed.

536,284
PB85-188894/GAR PC A02/MF A01
Radian Corp., Austin, TX.
EPA/AEERL (Environmental Protection Agency/ Air and Energy Engineering Research Laboratory) Source Testing Program for Coal Gasification Technologies (Kosovo Test Site),
K. J. Bombaugh, and W. J. Rhodes. 1985, 24p EPA/ 600/D-85/072
Contract EPA-68-02-3137

The paper summarizes EPA's environmental assessment testing program for synthetic fuels technology, with emphasis on the Kosovo source test and evaluation program. The Kosovo program included: (a) field tests to characterize process waste streams that would be input to control technologies in U.S. synfuels plants, (b) characterization of fugitive emissions, and (c) characterization of components in the ambient air and correlation of those components with source characterization data. Results from the Kosovo program have been (and are being) used: (a) to evaluate and select pollution control technologies for U.S. coal gasification plants using pressurized fixed-bed gasification technology, (b) as input to health studies, (c) to develop worker health and safety programs for U.S. synfuels plants, (d) to acquire environmental permits which address regulated and nonregulated pollutants, (e) to develop supplemental environmental monitoring plans required by the U.S. Synthetic Fuels Corporation, and (f) to develop and validate ambient air monitoring methodology.

536,285
PB85-188944/GAR PC A02/MF A01
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
Incorporating Meteorological Data Into Receptor Analysis: RAPS (Regional Air Pollution Study) Revisited,
S. A. Batterman, J. A. Fay, and D. Golomb. 1985, 21p EPA/600/D-85/061
Grant EPA-R-811534

An analysis of data collected in the St. Louis Regional Air Pollution Study indicates that about 72% of the annual average PM-15 aerosol is background material, presumably of regional origin. The fine and coarse fractions are composed largely of sulfate and crustal material, respectively. About 29% of the particle mass is unaccounted for assuming the measured elements are present as stable oxides. The ratio between PM-15 and TSP concentrations varied considerably among sites depending on averaging time and percentile. Dispersion model results corroborate the regional origin of the bulk of the aerosol. Annual average dispersion modeling can reproduce the observed annual concentrations from local sources emitting trace elements; however only about 14% of the PM-15 mass can be accounted for by local point sources. A sensitivity analysis indicates that incorporating settling and deposition processes in dispersion models is unlikely to significantly alter predicted concentrations from local sources.

536,286
PB85-189041/GAR PC A02/MF A01
PEDCo-Environmental, Inc., Cincinnati, OH.
Integrated Air Pollution Control for Coal-Fired Utility Boilers: A Computer Model Approach for Design and Cost-Estimating,
G. E. Baker, B. A. Laseke, T. C. Ponder, and J. O. Milliken. 1985, 18p EPA/600/D-85/078
Contract EPA-68-02-3693

The paper describes the Integrated Air Pollution Control System (IAPCS), a computerized program that can be used to estimate the cost and performance of precombustion, in situ, and post-combustion air pollution control configurations in pulverized-coal-fired utility boilers of 100 to 1000 MW. Modular program design and flexible parameter files allow the user to alter the design and cost basis of any control technology, optimize the emission/cost output, and identify least-cost control alternatives. Physical and chemical characteristics of the flue gas are calculated by material balance and reported in an emission-reduction summary. The program tracks changes in gas temperature, pressure, and volume; fly ash and alkalinity; gaseous pollutants and components; moisture content; and reagent recycling. Capital and annual cost estimates are presented in standardized format for easy comparison with other estimates. Control technologies include physical coal cleaning, limestone injection multistage burners (LIMB), low-NOx burners or overfire air ports, spray humidification, dry sorbent injection, dry scrubbing, limestone flue gas desulfurization, electrostatic precipitators, and fabric filters. Integrated combinations of these can be optimized both for existing boilers and for new boilers.

536,287
PB85-189058/GAR PC A03/MF A01
Environmental Protection Agency, Research Triangle Park, NC. Air and Energy Engineering Research Lab.
Acid Deposition Strategies, the LIMB (Limestone Injection/Multistage Burners) Program and Implications for Control Technology Requirements,
R. D. Stern. 1985, 31p EPA/600/D-85/079

The paper summarizes the various acid deposition bills introduced in the U.S. Congress during the past 2 years and discusses emission sources. A rapidly emerging technology called Limestone Injection/Multistage Burners (LIMB), which has the potential for simultaneous SO2 and NOx control, is described including background, current status, and plans. Finally, the possible implications of legislative alternatives and their effect on control technology requirements are presented. Acid rain continues to be a major environmental issue, and the importance of various acid precursor sources is still under debate. More than 15 bills that were pending in Congress required large sources of SO2 and/or NOx (two major pollutants resulting from the combustion of fuels) to reduce their emissions. Coal-fired utility boilers account for about 70% of the SO2 and 20-25% of the NOx emissions in the U.S. With this scenario, the timeliness and importance of low-cost control options applicable to these sources are evident. The breadth and depth of the research and development activities underway, both foreign and domestic, testify to the widespread interest in the potential benefits of these control technologies and the optimistic expectations for success in the on-going programs.

536,288
PB85-189066/GAR PC A06/MF A01
Monsanto Research Corp., Dayton, OH. Dayton Lab.
Evaluation of Hazardous Waste Incineration in an Aggregate Kiln: Florida Solite Corporation.
Summary rept.,
D. R. Day, L. A. Cox, and J. A. Peters. Apr 85, 112p SDM-06, EPA/600/2-85/030
Contract EPA-68-03-3025

Aggregate kiln incineration of chlorinated liquid organic waste was investigated in a one-week program at Florida Solite Company. POHCs (toluene, tetrachloroethylene, methyl ethyl ketone, and methyl isobutyl ketone) were monitored in waste and stack emissions. In addition, stack emissions were monitored for particulate matter, particulate trace metals, HCl, SO2, and NOx. Process samples were collected and analyzed for trace metals and chloride. The destruction and removal efficiency of POHCs and the fate of trace metals and chloride ion in the kiln process were determined.

536,289
PB85-189702/GAR PC A02/MF A01
Environmental Research Lab., Athens, GA.
EPA-Supported (Environmental Protection Agency-Supported) Wasteload Allocation Models,
T. O. Barnwell, and D. K. Boynton. 1985, 13p EPA/ 600/D-85/067

Modeling is increasingly becoming part of the Wasteload Allocation Process. The U.S. EPA provides guidance, technical training and computer software in support of this program. This paper reviews the support available to modelers through the Wasteload Allocation Section of EPA's Office of Water Regulation and Standards and through the Center for Water Quality Modeling of EPA's Office of Research and Development. The paper also looks to the future of water quality modeling and the prospect for principles from Artificial Intelligence increasing the accessibility of these tools to practitioners.

536,290
PB85-189868/GAR PC A06/MF A01
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
Accident Countermeasures at High-Speed Signalized Intersections. Phase 1. Synthesis of Practice.
Final rept.,
R. W. Eck, and Z. A. Sabra. Aug 84, 102p FHWA/ WV-84/003, WVDOH-71

Physical environments known to cause problems at high-speed signalized intersections are described. The three most commonly used types of active advance warning devices are discussed along with quantitative and qualitative assessments of their effectiveness. The three types of devices are: (1) flashing RED SIGNAL AHEAD signs, (2) PREPARE TO STOP WHEN FLASHING signs and (3) flashing strobe lights. Active devices are usually installed only as a last resort where conventional countermeasures have proven not to be effective. While specific situations where each type of device has been effective or where its use should be avoided were identified, there is a need for guidelines to define the use, design, installation and timing of active warning devices.

536,291
PB85-190981/GAR PC A06/MF A01
Grayman (Walter M.), Concinnati, OH.
Characterization of the Water Quality of the Lower Mississippi River,
W. M. Grayman. Apr 85, 107p EPA/600/2-85/043

This study was performed to characterize the water quality of the Lower Mississippi River and to survey the available data and methods that may be used for future water quality management studies of this stretch of river. Primary emphasis was placed on the 150 mile highly industrialized portion of the river from Baton Rouge, LA to New Orleans, LA. The concentration of many organic constituents in the river are characterized by significant high frequency, short term variations. A long term trend towards decreasing concentrations of most organics is apparent. There is little correlation of concentrations or joint occurrence between constituents. A wide array of models and methods were identified as potentially applicable to the Lower Mississippi River.

536,292
PB85-191104/GAR PC A02/MF A01
Municipal Environmental Research Lab., Cincinnati, OH.
Porous Pavements and Urban Hydrology,
R. Field. 1983, 6p EPA/600/D-85/074
Also pub. in Rural and Urban Roads, p48-50 Jul 84.

Porous pavements have potential as a technology for maintaining predevelopment runoff levels by allowing infiltration and groundwater recharge. By acting as an attenuation and runoff reduction device, these pavements can decrease the volume and peak flow rate and increase lag time. Porous asphalt pavements have been used in highway and airport runway construction. This open-graded asphalt mix has been referred to as

'popcorn mix', or 'porous friction course'. The material is laid to a thickness of 0.75 to 1 in. The resulting pavement has a course surface texture and a high void space-ratio. The course surface texture provides pressure relief channels to remove water under excess pressure between the pavement and vehicle tire. Temporary storage is minimal because rainfall is diverted in nearby drains.

536,293

PB85-191153/GAR PC A06/MF A01
Ford (Robert G.), Dallas, TX.
Evolution of a Regional Water Supply: A Case Study.
Final rept. Sep 81-Feb 85,
R. G. Ford. Apr 85, 108p EPA/600/5-85/001
Contract EPA-68-03-3104

A study was done to describe the development of a regional water supply system around the City of Dallas, Texas, and to summarize the issues surrounding the regionalization process. Data were gathered from written histories of Dallas, the City of Dallas Water Utilities Department, newspapers, case briefs, testimony from hearings, memos and letters, city ordinances, legislative actions, and interviews with participants. A chronological history is outlined for the water supply development and disputes, but activities are also discussed separately without regard to chronology. No criticism is offered of any of the involved parties.

536,294

PB85-191542/GAR PC A10/MF A01
North Carolina Univ. at Chapel Hill. School of Public Health.
Outdoor Smog Chamber Experiments to Test Photochemical Models: Phase 2.
Final rept. May 81-Apr 84,
H. E. Jeffries, K. G. Sexton, R. M. Kamens, and M. S. Holleman. Apr 85, 224p EPA/600/3-85/029
See also PB82-198508.

The smog chamber facility of the University of North Carolina was used to provide experimental data for developing and testing kinetic mechanisms of photochemical smog formation. In this study, 128 pairs of experiments were performed using NOx and various hydrocarbons and hydrocarbon mixtures. The experiments performed during this three-year project have been added to the existing UNC data base for model testing, bringing the total number of pairs of experiments to 346. This report presents an organizational scheme for these 346 experiments. This scheme enables users of the data to readily access specific portions of the data set. The report also contains guidance to modelers about which experiments should be simulated to test various aspects of the models and what order the experiments should be simulated in.

536,295

PB85-191666/GAR PC A04/MF A01
Environmental Measurements, Inc., University City, MO.
Transport of Pollutants in Plumes and Pepes: A Study of Transport of Pollutants in Power Plant Plumes, Urban and Industrial Plumes, and Persistent Elevated Pollution Episodes.
Final rept.,
W. M. Vaughan. Apr 85, 67p EPA/600/3-85/033
Contract EPA-68-02-3411

Because of the increased concern for the regional nature of secondary air pollutants (e.g., sulfates and oxidants) the U.S. Environmental Protection Agency (EPA) sponsored a major field program in the northeastern United States during the summer of 1980. Two EPA field programs were actually carried out simultaneously. One addressed persistent elevated pollution episodes, and the other continued the 1979 northeast regional oxidant study in developing part of the data base for the regional oxidant model. Field activities were based in Columbus, OH. Ten research aircraft and several mobile and stationary surface monitoring platforms from three EPA Contractors, seven Federal Agencies and four Universities participated in the intensive measurement program between 16 July and 15 August 1980. Pollutants measured included SO2, NO, NOx, O3, sulfate, nitrate, and aerosols. This report describes the Contractors' activities. Their aircraft logged over 350 flight hours in 100 missions ranging as far east as Laconia, NH, as far south as Montgomery, AL, as far west as Texarkana, AR, and as far north as Saginaw, MI. Descriptive analyses are summarized for urban plume missions and regional missions. The quality assurance program is described, showing the efforts made to develop a well coordinated data base. Sources for reports and data are provided.

536,296

PB85-191674/GAR PC A10/MF A01
Environmental Protection Agency, Cincinnati, OH. Drinking Water Research Div.
Plumbing Materials and Drinking Water Quality: Proceedings of a Seminar Held at Cincinnati, Ohio on May 16-17, 1984.
Feb 85, 202p EPA/600/9-85/007
Prepared in cooperation with Eastern Research Group, Inc., Cambridge, MA.

The seminar on Plumbing Materials and Water Quality was held at the Andrew Breidenbach Environmental Research Center in Cincinnati, Ohio on May 16 and 17, 1984. The purpose of the seminar was to review drinking water problems related to plumbing materials and to identify alternative solutions for dealing with these problems. The proceedings are a compilation of speaker's papers and panel session reports. The speaker's topics covered: (1) Plumbing Materials: Plumbing Materials on Water Quality, and (3) Impact of Plastic Pipe and Fittings on Water Quality.

536,297

PB85-191740/GAR PC A03/MF A01
Environmental Protection Agency, Ann Arbor, MI. Emission Control Technology Div.
Multiple Stringency Version of MOBILE3 Users Guide.
Technical rept.,
D. J. Brzezinski. Apr 85, 31p EPA/AA/TSS/IM-85/2

MOBILE3, as with all of the EPA mobile source models, uses a single stringency to identify the first year failure rate of TECH I (pre-catalyst) and Tech II (oxidation catalyst) vehicles in the Inspection and Maintenance (I/M) program to be modeled. This single number most often covers a wide range of technologies and vehicle classes when applied to an I/M program which inspects many model years and all vehicle types. Unless the outpoints used are carefully balanced, the actual failure rate may vary greatly from model year to model year and vehicle class to vehicle class. This single stringency input was meant to reduce the amount of input information necessary to model an I/M scenario. It is possible for MOBILE3 to use a separate stringency for each model year of each vehicle class. The only barrier has been the need to modify the input stream and appropriate subroutines to accept and utilize user supplied information. Such modifications have been done and the results are described in this report.

536,298

PB85-191849/GAR PC A03/MF A01
Water and Sanitation for Health Project, Arlington, VA.
Recommendations for Initial Water and Sanitation Decade Planning Activities in the Central African Republic.
Field rept.,
D. B. Warner. Sep 82, 27p WASH/FIELD-53, AID-PN-AAL-370
Contract AID/DSPE-C-0080

In the Central African Republic, where only four towns have piped water systems and no towns have sewer systems, little effective action has been taken by the Government to improve deteriorating water and sanitation conditions. This report describes current host government and donor efforts in the area of water and sanitation and outlines a detailed strategy for A.I.D. assistance in the preparation of a Water and Sanitation Decade plan. The Government of the Central African Republic is concerned about its water and sanitation problems but has only limited capabilities for solving them. The Government is currently establishing an interministerial National Action Committee (NAC) to coordinate water and sanitation activities. There is also growing donor interest in supporting water/sanitation efforts. Two regional projects to be supported respectively by WHO and the World Bank are in the final stages of review.

536,299

PB85-192227/GAR PC A06/MF A01
Environmental Research and Technology, Inc., Washington, DC.
Evaluation of the Environmental and Other Benefits of the Select Use of Natural Gas. Final Report, October 1982 - November 1983,
R. M. Dowd, E. T. Barfield, B. G. Doyle, M. J. Reilly, and I. B. Thomson. Nov 83, 114p GRI-82/0091
Contract GRI-5082-251-0682
Sponsored by American Gas Association, Inc., Arlington, VA.

Report examines the technical and environmental aspects of selectively firing natural gas with coal and oil feedstocks at six utility powerplants. Technical evaluation includes assessments of fuel composition and properties, combustion, equipment and boiler operational design, resulting air pollutant emissions and further research needs. Six case studies are used to evaluate the economic and environmental benefits to be achieved.

536,300

PB85-194215/GAR PC A10/MF A01
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Auctions and Alternative Procedures for Public Allocation with Application to the Distribution of Pollution Rights,
R. M. Lyon. Mar 81, 211p UILU-ENG-81-2005, NSF/PRA-81033
Grant NSF-PRA79-13131

This report examines auctions and related procedures and emphasizes both their theoretical properties and their public sector applications. Basic issues surrounding public allocation problems are addressed and the problem of allocating pollution rights is investigated. Further, auctions for items such as pollution rights are considered and a theoretical model of auctions for multiple homogeneous objects is presented. Equilibrium outcomes attainable by these auctions are characterized, and fair division procedures for invisible goods are described. Equilibrium bidding strategies are derived and it is shown that under assumptions of imperfect information and risk-neutral symmetric bidders, all efficient fair division procedures yield the bidders equivalent equilibrium expected profits. Allocation procedures' application to pollution rights distribution are analyzed and applications of alternative auctions and regulatory approaches are simulated and contrasted. Two case studies are presented to illustrate approaches utilizing economic incentives as possible alternatives to direct government regulation.

536,301

PB85-194405/GAR PC A06/MF A01
International Inst. for Environment and Development, Washington, DC.
Legal, Regulatory and Institutional Aspects of Environmental and Natural Resources Management in Developing Countries: A Country Study of Malaysia,
H. Gruppe, and W. Ofosu-Amaah. May 81, 105p AID-PN-AAN-853
Grant AID/DSAN-G-0027
Sponsored by National Park Service, Washington, DC.

Environmental and natural resource management and policy in Malaysia are reviewed in this report. After an overview of the country's regions, natural resources, and population groups, its environmental and natural resource problems are considered. These include: deforestation; water, coastal zone, marine, air, and noise pollution; soil erosion; and pesticide and fertilizer use. Next, the Government of Malaysia's resource management policy is assessed, followed by an overview of the country's administrative structure and legal system. Succeeding sections examine the environmental functions of government ministries, regulations for the various resource sectors, environmental planning and impact assessment, environmental features of the Strait of Malacca, and the role of nongovernmental organizations in environmental affairs.

536,302

PB85-199685/GAR PC A09/MF A01
Radian Corp., Austin, TX.
Biological Treatability of KRW Energy Systems Gasifier PDU (Process Development Unit) Wastewaters.
Final rept. Jun 83-Dec 84,
F. J. Castaldi. May 85, 186p EPA/600/7-85/019
Contract EPA-68-02-3137

The report gives results of bench-scale biological treatability tests with wastewaters produced from the

KRW Energy Systems gasifier process development unit (KRW-PDU). Goals of the tests were to assess the biotreatability of these aqueous wastes and to develop data for correlations to establish a basis for designing a biooxidation process. An autotrophic activated sludge process was developed that utilized a mixed culture of nitrifying and sulfur-oxidizing bacteria for simultaneous thiocyanate biodegradation and nitrification. Elevated concentrations of chloride, fluoride, and boron in experimental wastewaters did not inhibit either nitrifying or sulfur-oxidizing bacteria in the activated sludge process. However, heavy metals were concentrated in the activated sludges, thought to be a consequence of the long sludge ages of the experimental process.

536,303
PB85-201093/GAR PC **A15/MF A01**
Combustion Engineering, Inc., Windsor, CT.
Field Evaluation of a Low-NO(sub X) Firing System for Tangentially Coal-Fired Utility Boilers.
Final rept. Aug 81-Mar 84,
A. Kokkinos, and R. D. Lewis. May 85, 340p EPA/600/7-85/018
Contract EPA-68-02-3655

The report gives results of a full-scale utility demonstration of Combustion Engineering's Low-NOx Concentric Firing System (LNCFS), conducted at Utah Power and Light's 400 MWe Hunter No. 2 boiler. This program was implemented to investigate and evaluate the effectiveness of using concentric (offset) firing to reduce NOx emission levels from tangentially coal-fired utility boilers. The tests covered the period from August 1981 to March 1984 and included six short-term boiler characterization test series and four long-term (30-day) continuous emissions monitor (CEM) tests. A total of 384 characterization tests were conducted during the six test series, analyzing boiler performance and emissions as functions of excess air, load, fuel elevations in service, burner tilt, overfire air (OFA) flow, OFA tilt, offset angle, and fuel-air flow. Additionally, furnace wall corrosion was monitored, both short- (with corrosion coupons) and long-term (with wall thickness measurements), by another contractor. Overall program results have shown NOx emissions levels of about 0.4 lb NOx per million Btu for the 30-day continuous monitoring periods and about 0.3 lb NOx per million Btu for the short-term optimization tests. These levels represent 33 and 50% reductions in NOx emissions levels, respectively, from baseline standard operating procedures.

536,304
PB85-204378/GAR PC **A08/MF A01**
Radian Corp., Austin, TX.
Pilot-Scale Investigation of Closed-Loop Fly Ash Sluicing. Volume 1. Final Report,
S. T. Litherland, P. A. Nassos, M. L. Owen, and S. L. Winton. May 85, 170p RAD-83-211-004-35, EPA/600/7-85/021A
Contract EPA-68-02-3163
See also Volume 2, PB85-204386.

The report gives results of a pilot-scale demonstration of the technical feasibility of closed-loop operation of fly ash sluicing systems. Chemical species leached from the ash increase the dissolved solids concentration of recycled sluice water to a point where equipment scaling may occur. Tests were conducted at two power plants using a 50-gpm pilot unit to demonstrate the feasibility of closed-loop operation, both with and without sluice water treatment. An ash sluice computer process model was developed to predict chemistry and process conditions in full-scale systems. Fly ash sluicing systems handling highly reactive alkaline ashes cannot be operated closed-loop without treating the sluice water to control scale formation. Adding acid to adjust pH was effective in controlling calcium carbonate scale formation in the sluice water return line; however, it increased the potential for gypsum scale formation. Gypsum was ultimately the limiting species which prevented reliable closed-loop operation at the plants tested. Increased ash/water contact time in a reaction tank was not adequate to control the potential for gypsum scale formation at the residence time tested. The ash sluice computer process model proved to be accurate in predicting the chemical composition and potential for scale formation in the pilot unit.

536,305
PB85-204386/GAR PC **A19/MF A01**
Radian Corp., Austin, TX.
Pilot-Scale Investigation of Closed-Loop Fly Ash Sluicing. Volume 2. Appendices.
Final rept.,
S. T. Litherland, P. A. Nassos, M. L. Owen, and S. L. Winton. May 85, 449p RAD-83-211-004-35, EPA/600/7-85/021B
Contract EPA-68-02-3163
See also Volume 1, PB85-204378.

The report gives results of a pilot-scale demonstration of the technical feasibility of closed-loop operation of fly ash sluicing systems. Chemical species leached from the ash increase the dissolved solids concentration of recycled sluice water to a point where equipment scaling may occur. Tests were conducted at two power plants using a 50-gpm pilot unit to demonstrate the feasibility of closed-loop operation, both with and without sluice water treatment. An ash sluice computer process model was developed to predict chemistry and process conditions in full-scale systems. Fly ash sluicing systems handling highly reactive alkaline ashes cannot be operated closed-loop without treating the sluice water to control scale formation. Adding acid to adjust pH was effective in controlling calcium carbonate scale formation in the sluice water return line; however, it increased the potential for gypsum scale formation. Gypsum was ultimately the limiting species which prevented reliable closed-loop operation at the plants tested. Increased ash/water contact time in a reaction tank was not adequate to control the potential for gypsum scale formation at the residence time tested. The ash sluice computer process model proved to be accurate in predicting the chemical composition and potential for scale formation in the pilot unit.

536,306
PB85-861664/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Oil Spills: Legal Aspects. 1977-May 1985 (Citations from the Selected Water Resources Abstracts Data Base).
Rept. for 1977-May 85.
Jun 85, 308p
Supersedes PB83-864447. Prepared in cooperation with Office of Water Research and Technology, Washington, DC.

This bibliography contains citations concerning the legal aspects of oil spills. Topics include general perspectives on oil spills, EPA's response to oil spills, legal and corporate response to oil spills, public interest groups' attitudes on oil spills, and economic and political approaches to the problems caused by oil spills. Federal, state and local legislation dealing with these problems are emphasized. (This updated bibliography contains 313 citations, 163 of which are new entries to the previous edition.)

536,307
PB85-861870/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Public Utility Rate Structures. July 1983-June 1985 (Citations from the Energy Data Base).
Rept. for Jul 83-Jun 85.
Jun 85, 133p
Supersedes PB84-868389. Prepared in cooperation with Department of Energy, Washington, DC.

This bibliography contains citations concerning the methods, procedures, and issues of determining public utility rate structures. Topics include descriptions of regulatory policies (local, state, and federal), demand and marginal cost projections, retail electric rates, elasticity, subsidies, rate reforms, equity determination, risk assessment, and mathematical models. (This updated bibliography contains 166 citations, 57 of which are new entries to the previous edition.)

536,308
PB85-904200/GAR Subscription
Environmental Protection Agency, Washington, DC.
EPA (Environmental Protection Agency) Publications Bibliography Quarterly Abstract Bulletin.
Quarterly repts.
1985, 4 issues
Supersedes PB84-904200.
Paper copy available on subscription, North American Continent price $70.00/year; all others write for quote. Also avilable in single copies.

The EPA Cumulative Bibliography 1970-1976 published in December 1976 (order number PB-265 920) contains a bibliographic citation with abstract for reports generated by EPA and its predecessor agencies and entered into the NTIS collection through 1976. Access points to this cumulative are by Report Title; Subject (keyword); Corporate or Personal Author; Contract Number; and Accession/Report Number. Beginning in March 1977, quarterly update supplements were published listing and indexing EPA technical reports and journal articles entered into the NTIS collection during the preceding quarter. An additional index titled Sponsoring EPA Office was included as well. The fourth issue of the year contains bibliographic citations with abstracts for the preceding quarter and cumulative indexes for the calendar year.

13C. Construction Equipment Materials, and Supplies

536,309
AD-A153 529/3/GAR PC **A08/MF A01**
New Mexico Engineering Research Inst., Albuquerque.
Recycling Agent selection and Tentative Specification.
Final rept. 10 Mar 82-31 Jul 84,
B. M. Kiggundu, B. Nusser-Humphrey, and D. M. Zallen. Mar 85, 172p NMERI-TA5-15, AFESC/ESL-TR-84-47
Contract F29601-81-C-0013

This report summarizes a 2 1/2 year research effort toward developing a procedure by which a standard laboratory can define appropriate modifiers to recycle old paving-grade asphalt in hot central plant-recycling operations. Literature reviews and discussions with expert asphalt chemists, technologists, research institutions, and oil companies were conducted. Field-aged asphalt cores from different climatic areas and modifiers were collected and characterized. Characterization using physical and chemical tests were performed on aged binders, modifiers, fresh and RTFO aged blends, and recovered recycled aged binders. Recycled Marshall mixtures were prepared and periodically characterized during accelerated oven aging. Chemical parameters identified were used to establish the laboratory test matrix. These parameters included the Polar/Saturate (P/S) ratio and percent generic aromatics as determined by a modified Clay-Gel (ASTM D2007) method. The results indicate that some chemical and physical properties can be correlated and that modifier/aged asphalt compatibility can be assessed by chemical methods developed in this study. Finally, a tentative recycling agent selection specification has been developed, but more research is required for validation.

536,310
PB85-189793/GAR PC **E03/MF E03**
Electricity Council Research Centre, Capenhurst (England).
Increase in U-Value of a Wall Caused by Mortar Joints,
D. A. McIntyre. Jun 84, 17p ECRC/M-1843

Following the recent revisions to the Building Regulations, low conductivity insulating blocks have been marketed which are claimed to provide a wall U-value of 0.6 W/sq m K using conventional cavity construction and no additional insulation. Finite element analysis has been used to investigate heat flow in the wall structure. Conventional mortar joints degrade the U-value from the nominal 0.6 to an actual 0.7 W/sq m K. This Memorandum examines heat loss through mortar joints in some detail and shows how the U-value of a wall varies with mortar thickness and thermal conductivity.

536,311
PB85-860898/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Geotextiles. 1983-May 1985 (Citations from World Textile Abstracts).
Rept. for 1983-May 85.
Jun 85, 57p
Prepared in cooperation with Shirley Inst., Manchester(England).

This bibliography contains citations concerning applications of geotextiles in earthworks, waterworks, and

road construction projects. The uses of fabrics in soil stabilization, coastal protection, drainage systems, water conservation, and waste treatment operations are discussed. Development trends and market evaluations of textile materials for geological engineering applications are reviewed. (Contains 81 citations fully indexed and including a title list.)

13D. Containers and Packaging

536,312

AD-A153 652/3/GAR PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Rapid Drinking Devices Constructed from I.V. (Intravenous) Bags and Plastic Squeeze Bottles,
I. V. Sils, P. C. Szlyk, L. E. Armstrong, and B. Jones. Apr 85, 8p Rept no. USARIEM-M24/85

Adequate fluid intake is essential for any athelete involved in long distance running. The primary problem with using a plastic water bottle during a race is that it must be held upright and squeezed tightly while the runner holds his breath and waits for a sufficient amount of water to enter his mouth before swallowing. With this procedure very little water is actually consumed. We have designed a drinking device which allows the athelete to consume large quantities of fluid in a short period of time with minimal loss of contents through accidental spillage. The device can be constructed either from an intravenous (IV) bag obtained through a physician or a medical supply house, or from a standard plastic water bottle. By drinking from the inverted device, approximately one cup of water can be consumed in about seven seconds.

536,313

DE85780463/GAR PC **A03**/MF **A01**
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German D.R.).
Testing of Type A and B Packages in Accordance with IAEA Transport Regulations.
F. Nitsche, K. Runge, W. Birkigt, and E. Mueller. 1984, 39p SAAS-314, CONF-8205289-1
Inter-regional training course of the safe transport of radioactive materials, Harwell, UK, 12 May 1982.
U.S. Sales Only.

Revised and extended version of a paper was presented during the Interregional Training Course on the Safe Transport of Radioactive Materials, organized by the IAEA, Harwell, May 1982, dealing with the test conditions for Type A and Type B packages as well as possible test methods, the performance of testing, and the assessmnt of test results. (Atomindex citation 15:073325)

13E. Couplings, Fittings, Fasteners, and Joints

536,314

AD-A153 520/2/GAR PC **A03**/MF **A01**
Aeronautical Research Labs., Melbourne (Australia).
Elastic Response of a Half-Plane to a Bonded Interference-Fit Disc of the Same Material.
Structures rept.,
G. S. Jost, and R. P. Carey. Jul 84, 36p Rept no. ARL/STRUC-R-406

This report from Australia examines analytical expressions for the stress and displacement fields in a half-plane containing a bonded interference-fit disc of the same material. Some representative geometric configurations were evaluated, the results being given in both tabular and graphical forms.

536,315

AD-A153 630/9/GAR PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Fatigue Behavior of HY-130 Steel Weldments Containing Fabrication Discontinuities.
Memorandum rept.,
S. J. Gill, J. A. Hauser, T. W. Crooker, B. J. Kruse, and R. Menon. 18 Apr 85, 39p Rept no. NRL-MR-5520

Fabrication discontinuities in weldments pose a serious engineering problem for structural applications involving cyclic loading. Often, the discovery of fabrication discontinuities through nondestructive inspection can pose a dilemma; if not properly repaired, failure can result from crack initiation and growth, however, if improperly repaired, post-repair discontinuities of even greater severity may result. Thus, a need exists for rational decision-making criteria to assess the mechanical severity of actual fabrication defects in weldments. This study was undertaken to explore the applicability of linear elastic fracture mechanics to characterize the fatigue behavior of high-strength steel weldments containing lack-of-penetration (LOP) and slag/lack-of-fusion (S/LOF) discontinuities. Full penetration, double-V butt welds with reinforcements removed were tested under zero-to-tension axial loading. Various filler metals and welding techniques were used. Both sound welds and welds containing discontinuities were cycled to failure. Whenever possible, cycles to crack initiation were estimated by strain gage measurements. The fracture mechanics approach was successful in correlating the fatigue lifetimes of specimens containing single LOP discontinuities of varying size. However, the fatigue behavior of specimens containing multiple S/LOF discontinuities proved to be much more complex and difficult to analyze.

536,316

AD-A153 755/4/GAR PC **A05**/MF **A01**
Martin Marietta Labs., Baltimore, MD.
Mechanical Properties of Adhesively Bonded Aluminum Structures Protected with Hydration Inhibitors.
Final rept. 1 May 82-31 Jan 85,
G. D. Davis, J. S. Ahearn, and J. D. Venables. Mar 85, 97p Rept no. MML-TR-85-7(C)
Contract N00014-80-C-0718

The use of hydration inhibitors to improve the durability of adhesively bonded aluminum structures was investigated. Pretreatment of Forest Products Laboratory (FPL) adherends in a solution of an inhibitor, such as nitrilotris methylene phosphonic acid (NTMP), increases bond durability dramatically, so that, in some cases, hydration of the adherend is no longer the limiting step in crack propagation. Pretreatment of phosphoric-acid-anodized (PAA) adherends further improves durability so that the transition to failure in the adhesive occurs at a shorter crack length. The initial strength for bonds using epoxy adhesives is not changed by such pretreatments. Adsorption of NTMP onto FPL surfaces displaces the water initially present by the formation of P-O-Al bonds. Saturation coverage is approximately one monolayer. Adsorption of NTMP onto PAA surfaces, which have little initial water, results in the occupation of residual active sites. Hydration of an inhibited FPL surface proceeds in three steps: (1) reversible physic-sorption of water, (2) slow dissolution of the inhibitor-aluminum complex followed by rapid hydration of the freshly exposed amorphous aluminum oxide to boehmite, and (3) further hydration of the boehmite to bayerite.

536,317

PB85-187326 Not available NTIS
National Bureau of Standards, Boulder, CO. Fracture and Deformation Div.
Fitness-for-Service Criteria for Pipeline Girth-Weld Quality.
Final rept.,
R. P. Reed, M. B. Kasen, H. I. McHenry, C. M. Fortunko, and D. T. Read. Jul 84, 80p
See also PB84-165448. Sponsored by Department of Transportation, Washington, DC. Office of Pipeline Safety Regulation.
Pub. in Proceedings of Welding Research Council Bulletin No. 296, 80p Jul 84.

Criteria have been developed for applying fitness-for-service analyses to flaws in girth welds. A critical crack-opening-displacement elastic-plastic fracture mechanics model was developed and experimentally verified. Procedures for constructing flaw acceptance curves based on this model are provided. A significantly improved ultrasonic method for detecting and dimensioning significant weld flaws was developed. The probability of crack initiation from blunt flaws was shown to be very low under severe low-cycle fatigue. Suggestions are offered for technical implementation of field inspection procedures and for practical implementation of the flaw acceptance criteria.

13F. Ground Transportation Equipment

536,318

DE85008933/GAR PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Electric and Hybrid Vehicle Program, FY-1985 Program Plan.
G. L. Hunt. Feb 85, 33p EGG-SE-6752
Contract AC07-76ID01570

This program plan serves as the primary management document for the INEL Electric and Hybrid Vehicle (EHV) Program. Programmatic objectives are set forth, the scope of the work is defined, and the management methodologies used to perform and control the work are presented. Programmatic interfaces and attendant responsibilities are defined. A technical plan describing the engineering tests, development work and technical support activities which constitute the core of the program is provided. (ERA citation 10:022827)

536,319

PB85-175313/GAR MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Les Chemins de fer et l'Energie (Railroads and Energy).
World Bank staff working paper,
L. L. Alston. c1984, 103p WP-634F
Text in French. See also English version, PB85-202265.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC 20433.

A railway vehicle requires substantially less propulsive energy than a road vehicle of the same weight moving at the same speed. Railways have a substantial energy advantage for large volumes of bulk commodities, but for passenger transport they are generally no more energy-efficient than buses. Part I also contains a review of measures for increasing the railways' energy efficiency, and it is shown that significant gains may be achieved through operational improvements. Railway electrification is discussed in Part II. An analysis, suitable for pre-feasibility studies, is presented for estimating the traffic at which electrification becomes economically viable. (Copyright (c) 1984 The International Bank for Reconstruction and Development.)

536,320

PB85-183101/GAR PC **A03**/MF **A01**
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
Evaluation of Pacal Snowplow Blades for Winter Maintenance,
Special rept.,
R. P. Ungerer. Jul 84, 40p FHWA/NY/SR-84/78

An expanded study monitoring performance of 50 Pacal and 14 carbide-insert snowplow blades was conducted. Blade-wear information was obtained from 14 county residencies located in six Department regions, in addition to operated-estimated plowing mileage and questionnaire results. This report covers data collection, analysis, and model-development phases of this study, concluding with some management decision aids for choosing the least-cost statewide strategy for snowplow-blade allocation.

536,321

PB85-183879/GAR PC **A10**/MF **A01**
Mass Transit Administration of Maryland, Baltimore.
Electromagnetic Interference Mitigation of Audio-frequency Signaling System for Baltimore Region Rapid Transit System.
Final rept. Aug 79-Oct 83,
T. C. Vaughn, C. Mokkapati, and R. P. Bozio. Nov 83, 217p UMTA-MD-06-0072-83-1
Grant DOT-UMTA-MD-06-0072
Prepared in cooperation with American Standard, Inc., Swissvale, PA. Union Switch and Signal Div.

This report presents the results of the five phases of work done on the electromagnetic compatibility of the audio-frequency train detection and cab signaling system (commercially known as the AF-400 system) with the Westinghouse Electric propulsion chopper. The authors note that a new audio-frequency receiver, which is immune to induced electromagnetic interference from the chopper equipment, has been designed, tested and successfully applied. The signalling system and the propulsion control chopper system are being used on the Baltimore Region Rapid Transit System and the Metropolitan Dade County Rapid Transit System. This report also includes information on the manufacturing, design and installation drawings, qualification test procedures and results, and field test procedures and results applicable to the audio-frequency signaling system.

536,322

PB85-184406/GAR PC **A07/MF A01**
Michigan Univ., Ann Arbor. Transportation Research Inst.
Relationship of Truck Tire/Wheel Nonuniformities to Cyclic Force Generation.
Final rept. Apr 79-Dec 82,
T. D. Gillespie. Apr 84, 139p UMTRI-84-18
Sponsored by Motor Vehicle Manufacturers Association of the United States, Inc., Detroit, MI.

Nonuniformities in the tire/wheel assemblies of heavy trucks, such as mass imbalance or dimensional runout, add to the ride vibrations on the road at the rotational frequency of the wheel and harmonics thereof. The relationships between nonuniformities in the individual components and the excitation forces produced by the overall assembly are largely unknown. An experimental research program was conducted in which nonuniformities in tire and wheel components and the force variations of the overall assembly were measured on a tire uniformity test machine. The testing covered radial and bias-ply truck tires of the tubeless- and tube-type, disc and cast-spoke wheels, single and dual configurations, and variations in load, pressure, and speed. For tires, the various measures of nonuniformities are related to force variations in the radial, lateral, and tractive force directions. Runouts in the wheel/hub assembly are shown to influence radial force variations directly. Mounting practice is shown to have a significant influence on radial force variations of dual cast-spoke wheels.

536,323

PB85-188233/GAR PC **A08/MF A01**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
Network Management Simulation of Automated Guideway Rapid Transit Systems under Vehicle-Follower Control.
Final rept.,
H. Y. Chiu, D. L. Kershner, and P. J. McEvaddy. Oct 84, 154p JHU/APL/CP-086/TPR/047, UMTA-MD-06-0047-84-1
Contract DOT-UT-90042

This report points out that the use of Automated Guideway Rapid Transit (AGRT) has been proposed as a means of alleviating many of the problems associated with conventional transportation modes in urban areas. The concept of AGRT requires the deployment of remotely controlled vehicles in a dedicated guideway network. Many control strategies have been proposed to handle the simultaneous longitudinal control of possibly hundreds of these vehicles. One generic approach is vehicle-follower, in which vehicle state information is used to command vehicle spacing and velocity of the immediately following vehicle. This report states that vehicle-follower control has been extensively examined at the individual vehicle interaction level; however, the network effects of vehicle-follower are relatively unassessed. The principle objective of this study is to examine the network level behavior of a vehicle-follower approach to longitudinal control in AGRT systems. A computer simulation was developed for the evaluation of station operations, vehicle management techniques, and vehicle-follower longitudinal control algorithms in a full AGRT network context. The simulation was then exercised to investigate the performance characteristics of and interactions among vehicle control, network management, and station models.

536,324

PB85-189876/GAR PC **A08/MF A01**
Bolt Beranek and Newman, Inc., Cambridge, MA.
Freight Train Brake System Safety Study.
Final rept. Jul 80-Aug 83,
E. K. Bender, L. E. Wittig, and J. D. Stahr. Aug 83, 152p BBN-5110, FRA/ORD-83/18
Contract DTFR53-80-C-00113

This report presents the development of railroad brake system dynamic models and the results of an experimental study of the effects of water and ice on brake friction. Dynamic computer models account for brake signal propagation through a pneumatic air line, for pressure gradients associated with brake line leakage, brake system application, and stopping distance. Models are exercised and it is found that results compare well with a limited amount of available experimental data. Dynamometer studies of composition and cast metal shoes show that water and ice contamination can significantly affect braking performance. Water on composition shoes can increase train stopping distance by a factor of two; in contrast, even small amounts of water on cast iron shoes can decrease stopping distance by as much as 25%. Ice on brake shoes can increase stopping distance by a factor of 17 when compared with dry shoes.

536,325

PB85-189884/GAR PC **A12/MF A01**
National Highway Traffic Safety Administration, East Liberty, OH. Vehicle Research and Test Center.
Side Interior Stiffness Measurement.
Final rept. May 83-Sep 84,
D. Willke, and M. W. Monk. Sep 84, 258p DOT-HS-806 708

A study was done to catalog the stiffness characteristics of door areas, A-pillars, B-pillars, and roof rails of several vehicles. Dynamic component tests were performed on the door interiors and various upper interior structures using rigid thoracic and head impactors. Static crush tests were done on the door exteriors. Results of these tests are presented. Injury potentials were estimated and correlated to the measured stiffness characteristics. The results of these correlations are presented and discussed.

536,326

PB85-202265/GAR MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Railways and Energy.
World Bank staff working paper,
L. L. Alston. c1984, 93p WP-634, ISBN-0-8213-0345-7
See also French version, PB85-175313. Library of Congress catalog card no. 84-3506.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC 20433.

A railway vehicle requires substantially less propulsive energy than a road vehicle of the same weight moving at the same speed. Railways have a substantial energy advantage for large volumes of bulk commodities, but for passenger transport they are generally no more energy-efficient than buses. Part I contains a review of measures for increasing the railways' energy efficiency, and it is shown that significant gains may be achieved through operational improvements. Railway electrification is discussed in Part II. An analysis, suitable for pre-feasibility studies, is presented for estimating the traffic at which electrification becomes economically viable. (Copyright (c) 1984 The International Bank for Reconstruction and Development.)

13H. Industrial Processes

536,327

AD-A153 728/1/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Selective Tungsten Silicide Formation by Ion-Beam Mixing and Rapid Thermal Annealing.
Journal article,
B. Y. Tsaur, C. K. Chen, C. H. Anderson, and D. L. Kwong. 15 Mar 85, 6p JA-5671, ESD-TR-85-178
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in Jnl. of Applied Physics, v57 n6 p1890-1894, 15 Mar 85.

Smooth layers of tungsten silicide have been formed on silicon substrates by deposition of a tungsten film, As+ ion implantation through the film to produce ion-beam mixing, and rapid thermal annealing. This process has been used to form tungsten silicide selectively in patterned openings etched in the SiO2 film on oxidized Si wafers, without lateral silicide growth. Rapid thermal annealing results in the activation of the As implanted in the Si substrate, without significant redistribution, to form shallow n (+) -p junctions with good electrical properties. This process should be useful for the fabrication of MOSFETs with self-aligned-silicide gate, source, and drain.

536,328

AD-A153 783/6/GAR PC **A06/MF A01**
Corning Glass Works, NY.
Downdraw Extrusion of ULE(TM) Glass.
Final rept. Jul 83-Jul 84,
P. M. Smith, and C. E. Peters. Dec 84, 107p RADC-TR-84-259
Contract F30602-83-C-0121

This report documents an experiment to determine whether it is possible to extrude Ultra Low Expansion (ULE) silica glass. A heat cycle experiment was performed which demonstrated that the material could withstand the time/temperature cycle required in the appropriate chemical environments. Extrusion apparatus was then assembled, configured and tested. Two runs were made in which ULE was extruded. Although the results showed much scatter of the data, the mean properties of the extruded material were the same as for the control material, which suggests that with more process optimization, extrusion of ULE in sufficiently high quality for mirrors should be possible.

536,329

AD-A153 851/1/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Transient Annealing of Selenium-Implanted Gallium Arsenide Using a Graphite Strip Heater.
Journal article,
R. L. Chapman, J. C. C. Fan, J. P. Donnelly, and B. Y. Tsaur. 1 May 82, 4p JA-5313, ESD-TR-85-061
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v40 n9 p805-807, 1 May 82.

A graphite strip heater has been used for transient annealing, at temperatures of 900-1140 C, of GaAs wafers implanted at 300 C with a 10 to the 15th power/sq cm dose of 400-keV Se (+) ions. The electrical activation of the implant produced by annealing at 1140 C for 10s yields a sheet resistivity of 25 ohms/square abd sheet carrier concentration of 1.8 x 10 to the 14th power/sq cm, compared with values of 35 ohms/square 1.1 x 10 to the 14th power obtained by conventional furnace annealing at 950/C for 30 min.

536,330

PB85-187821 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Sensory Interactive Control Systems for Advanced Manufacturing.
Final rept.,
G. J. Vanderbrug, J. S. Albus, and A. J. Barbera. 1980, 9p
Sponsored by International Federation of Automatic Control, Laxenburg (Austria) and International Federation for Information Processing, Geneva (Switzerland).
Pub. in Proceedings of Information Control Problems in Manufacturing Technology, IFAC/IFIP Symposium (2nd), Stuttgart, Germany, October 22-24, 1979, p137-145 1980.

Fundamental understanding of sensory interactive control systems is an important step in applying advanced manufacturing techniques. Functional requirements and an architecture for a sensory interactive robot control system are presented. A model for studying the interaction between the control and sensory parts of a system is presented. The model consists of parallel control decomposition and sensory analysis hierarchies. A robot vision system is described, with special emphasis on the nature of its interaction with the control part of the system.

536,331

PB85-861037/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.

Spray Painting. 1970-May 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-May 85.
Jun 85, 116p

This bibliography contains citations of selected patents concerning methods and apparatus for spraying paint in industrial applications. Paint spray booths, control systems, safety devices, and spray guns are discussed. Paint spray systems relative to fire protection, ventilation, automatic color change devices, and surface masking are considered. (Contains 156 citations fully indexed and including a title list.)

536,332
PB85-861805/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Laser Cutting and Machining: Metals. 1970-June 1985 (Citations from the Engineering Index Data Base).
Rept. for 1970-Jun 85.
Jun 85, 148p
Supersedes PB83-804211.

This bibliography contains citations concerning laser applications in metalworking. Topics include development and technological reviews, theoretical studies, and product quality evaluations. The utilization of laser devices for welding, cutting, drilling, and scribing a variety of metals is discussed. Heat transfer and the effects on machined materials, and economic aspects of laser metalworking are also considered. Considerable attention is given to carbon dioxide lasers. (This updated bibliography contains 243 citations, 41 of which are new entries to the previous edition.)

536,333
PB85-861847/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Aided Plastic and Rubber Manufacturing. 1973-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Jun 85.
Jun 85, 99p

This bibliography contains citations concerning developments and applications of computer aided manufacturing techniques in rubber and plastics industries, including computer aided design, control, quality control, and the utilization of industrial robots. Automated molding, extrusion, compounding, and material handling are analyzed. Integrated computer aided design and manufacturing systems, and robotic manufacturing centers are discussed with respect to productivity and quality improvment. (Contains 156 citations fully indexed and including a title list.)

536,334
PB85-861912/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Anodizing Aluminum. 1974-June 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jun 85.
Jun 85, 106p
Supersedes PB84-865864. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the properties, production processes, and applications of anodized aluminum. Processes discussed include phosphoric acid, sulfuric acid, molten salt, and chromic acid solutions. Spray, dip, and plasma anodizing methods are considered. The automation of continuous and bulk anodizing techniques are presented. Nondestructive testing, atmospheric weathering, and accelerated testing of anodized aluminum are included. (This updated bibliography contains 125 citations, 10 of which are new entries to the previous edition.)

536,335
PB85-862142/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Adhesive Bonding of Aluminum and Aluminum Alloys. 1973-June 1985 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Jun 85.
Jun 85, 179p
Supersedes PB84-869098.

This bibliography contains citations concerning the adhesive bonding of aluminum and aluminum alloys. Topics include adhesive strength testing, shear strength of adhesive bonded joints, mechanical properties, and surface treatments and preparations. Various adhesive materials are discussed with applications in printed circuit board manufacture, solar collectors, and aircraft components. (This updated bibliography contains 258 citations, 39 of which are new entries to the previous edition.)

536,336
PB85-862225/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Molecular Beam Epitaxy: Principles and Non-Gallium Arsenide Applications. 1975-June 1984 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-Jun 84.
Jun 85, 300p

This bibliography contains citations concerning principles and non-gallium arsenide applications of molecular beam epitaxy. Topics include molecular beam epitaxial growth, epitaxial layer properties, elemental semiconductors, semiconductor materials and device fabrication, surface and interface physics, and molecular beam characteristics. Growth properties and processes, vacuum techniques, semiconductor doping, carrier mobility, and impurity characteristics are included. (This updated bibliography contains 350 citations, none of which are new entries to the previous edition.)

536,337
PB85-862233/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Molecular Beam Epitaxy: Principles and Non-Gallium Arsenide Applications. July 1984-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for Jul 84-Jun 85.
Jun 85, 106p
Supersedes PB84-867399.

This bibliography contains citations concerning principles and non-gallium arsenide applications of molecular beam epitaxy. Topics include molecular beam epitaxial growth, epitaxial layer properties, elemental semiconductors, semiconductor materials and device fabrication, surface and interface physics, and molecular beam characteristics. Growth properties and processes, vacuum techniques, semiconductor doping, carrier mobility, and impurity characteristics are included. (This updated bibliography contains 107 citations, all of which are new entries to the previous edition.)

13I. Machinery and Tools

536,338
AD-A153 479/1/GAR PC **A06**/MF **A01**
TRW Aircraft Components Group, Cleveland, OH. Materials and Mfg. Technology Center.
Powder Metallurgy Forged Gear Development.
Rept. for Sep 80-Jul 84,
D. H. Ro, B. L. Ferguson, S. Pillay, and D. T. Ostberg. Mar 85, 112p TACOM-TR-13046
Contract DAAE07-80-C-9115

The purpose of this project to investigate and develop powder forging methods for producing high-performance gears from sintered performs. Three gears have been forged from grade 4600 steel powder to which sufficient graphite was added to achieve the desired final carbon level. The first gear, referred to as the NASA test gear because it was designed specifically for gear testing at NASA Lewis Research Center, was forged from 4620 and 4640 steel powder preforms. This gear was a straight spur gear with 28 involute teeth, a 0.25 inch-(6.35 mm) thick web, and a top and bottom hub. Both net teeth and oversize teeth (0.004 inches grinding stock per side) were forged, with these gears being carburized after forging. Gears were then tested in a four square gear testing rig at NASA under the guidance of Dennis Townsend. Using a maximum Hertzian stress of 248,000 psi at pitch line and a gear rotational speed of 10,000 rpm, gear lives were obtained for these gears.

536,339
PB85-185940/GAR PC **E04**/MF **E04**
Plastics and Rubber Inst., London (England).
Mouldmaking '85 - A Conference Held at Library Theatre, Solihull, West Midlands on 31 January 1985.
Jan 85, 59p

Topics include: A Users Viewpoint on Computer aided design/Computer aided manufacturing (CAD/CAM); Computerized numerical control (CNC) Machining in Mouldmaking; Electrical discharge machining (EDM) and CNC EDM; EDM Electrodes; A New Approach to Training Craftsman Managers; Effects of Machine Developments on Mould Design.

536,340
PB85-198455/GAR PC **A06**/MF **A01**
Maurer Engineering, Inc., Houston, TX.
Development of a Guided Horizontal Boring Tool. Phase 1. Final Report, January - November 1984,
G. T. Pittard, W. J. McDonald, J. E. Bridges, and J. O. Enk. Nov 84, 152p MEI-TR84-31/EO8405-FR, GRI-84/0236
Contract GRI-5084-271-0889
Prepared in cooperation with IIT Research Inst., Chicago, IL.

Technologies were reviewed to determine the feasibility of developing a guided horizontal boring tool for installing gas distribution piping at distances up to 120 feet. Percussion moles were selected as the best candidate boring tools. Methods for steering the moles were designed, built and evaluated in laboratory and field trials. The best system combines a beveled nosepiece with rear-mounted fins to orient the tool. Technologies were reviewed to determine the feasibility of a simple, rugged and easily implemented technique capable of tracking a guided horizontal boring tool and detecting some, if not all, obstacles. Six candidate approaches were identified and key features were evaluated in laboratory and field tests. The viability of a magnetic field attitude sensing and orientation system was demonstrated. Several obstacle detection or proximity approaches suitable to stop the progress of the tool prior to impacting a metal or plastic pipe were also demonstrated in the laboratory to be potentially feasible. These are based on detecting the highly localized perturbations in the electromagnetic field introduced by a pipe which has a radically different conductivity than the earth.

536,341
PB85-862050/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Press Tools: Design, Automation, and Safety. 1973-November 1983 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for 1973-Nov 83.
Jun 85, 150p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the design, manufacturing, operation and automation processes of press tools. Manual and power presses utilized for forging, stamping, blanking, punching, hot pressing, and briquetting are among those discussed in this bibliography. Noise control, safety, control systems and selection recommendations are included. (This updated bibliography contains 325 citations, none of which are new entries to the previous edition.)

536,342
PB85-862068/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Press Tools: Design, Automation, and Safety. December 1983-June 1985 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for Dec 83-Jun 85.
Jun 85, 43p
Supersedes PB84-853555. Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the design, manufacturing, operation and automation processes of press tools. Manual and power presses utilized for forging, stamping, blanking, punching, hot pressing, and briquetting are among those discussed in this bibliography. Noise control, safety, control sys-

tems and selection recommendations are included. (This updated bibliography contains 59 citations, all of which are new entries to the previous edition.)

13J. Marine Engineering

536,343
AD-A153 445/2/GAR PC A03/MF A01
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD. Ship Performance Dept.
Local Propeller Blade Flows in Uniform and Sheared Onset Flows Using LDV (Laser Doppler Velocimetry) Techniques.
Final rept.,
S. D. Jessup, C. G. Schott, M. F. Jeffers, and S. Kobayashi. Feb 85, 28p Rept no. DTNSRDC-85/007
Presented at the 15th ONR Symposium, Hamburg, Germany, Sep 84.

Laser Doppler Velocimetry techniques were used to measure local propeller blade flows in the DTNSRDC 24-inch water tunnel. Velocity measurements were made upstream, downstream, and between blades. Measurements were made near the blade surface to identify potential flow surface pressure coefficients and streamwise boundary layer profiles. Blade surface flow visualization was correlated with the measured boundary layer characteristics. Blade pressure distributions and streamwise boundary layer growth were compared with theory. Exploratory velocity measurements were made ahead of a propeller operating in an axisymmetric sheared inflow, and velocity and thrust correlations were made with theory. Measured velocities about the propeller showed good agreement with potential theory ahead of the propeller with discrepancies occurring downstream of the propeller due to viscous effects. Measured boundary layer growth at midspan of the propeller blade was approximated well by two-dimensional boundary layer theory. Boundary layer profile measurements verified the location of transition determined from flow visualization technique.

536,344
AD-A153 613/5/GAR PC A03/MF A01
Coast Guard Research and Development Center, Groton, CT.
Side by Side Buoy Tender Evaluation Seakeeping and Maneuvering Comparisons of the USCGC MALLOW (WLB-396) and SSP KAIMALINO (Semi-Submersible Platform).
Final rept.,
T. J. Coe. Feb 84, 48p CGR/DC-1/84, USCG-D-34-84

The SSP KAIMALINO, an 89 foot, 225 long ton Small Waterplane Area Twin Hull (SWATH) ship, is evaluated as a buoy tender platform, side by side with the USCGC MALLOW, a 180 foot, 1,025 long ton monohull buoy tender. Seakeeping comparisons are presented wave heights at 8 and 12 knots respectively. The SWATH proved to have far superior seakeeping abilities compared to the conventional displacement hull buoy tender in the seaway. Buoy tending evaluations were simultaneously conducted in 4.3 foot significant wave heights. Vessel motions in roll and pitch are compared during slow speed (0-2 knots) buoy tending operations. A comparison of vessel maneuverability was accomplished by conducting Dieudonne spiral maneuvers as well as zig-zag (overshoot) tests at both 4 and 8 knot runs. Both vessels demonstrated good maneuvering control. These tests were a joint effort with the U.S. Navy, Navigation, leeway, station keeping and buoy tending evolutions were evaluated and presented in a separate companion report entitled, 'Side-By-Side Buoy Tending Trials of the SWATH Ship SSP KAIMALINO and the USCG Cutter MALLOW (WLB-396)' by A.T. Strickland, published by the Naval Ocean Systems Center, San Diego, CA.

536,345
AD-A153 616/8/GAR PC A06/MF A01
Naval Postgraduate School, Monterey, CA.
Optimization of Surface Ship Steering in Sea State.
Master's thesis,
E. Horianopoulos. Dec 84, 117p

Propulsion losses are increased by added drag due to steering of the ship. A carefully designed automatic steering control provides the desired heading while it simultaneously minimizes the rudder activity and holds the potentials for reducing propulsive losses. A computer model of the SL-7 containership along with a cascaded controller (one pole, One zero) were coupled to a function minimization subroutine and a sea state generator program. This scheme provided the appropriate controller parameters in order to accomplish the best performance. The model was tested in calm waters and sea states (regular and irregular as well, for a certain speed and different encounter wave angles and encounter frequencies. Also, an adaptive control was studied which updates the controller parameters while either the environmental conditions or the ship's steering characteristics change in order to maintain optimal steering performance.

536,346
AD-A153 815/6/GAR PC A06/MF A01
Naval Postgraduate School, Monterey, CA.
Maritime Options for the Future - The Means to Revitalize the U.S. Merchant Marine.
Master's thesis,
R. C. Hessdoerfer. Dec 84, 116p

This study examines current options facing legislators and policy makers who make decisions regarding the United States merchant marine and its related industrial support base, the shipbuilding industry. Included is a brief history of the merchant marine and the effects of past legislation, leading to the current environment faced by the members of the maritime industries. A brief review of the current government programs in the area of strategic sealift is addressed as well. The analysis includes the opinions and impressions of various representatives of the maritime industry, shipbuilders and ship operators, as well as government officials. This study culminates with a discussion of the current options being addressed in Congress. Conclusions and recommendations are drawn based on the author's findings and opinions. Originator-supplied keywords: Merchant Marine, Strategic sealift, Maritime policy, Shipbuilding, and Maritime legislation.

536,347
AD-A153 845/3/GAR PC A09/MF A01
Ideamatics, Inc., Washington, DC.
Development of Alternatives to the Current Safe Powering Standard.
Final rept.
Sep 82, 182p USCG-D-3-85
Contract DTCG23-80-C-20003

A two-year study of alternatives to the current safe powering standard was performed, This study incorporates a literature search and review of mathematical models for small boat maneuvering, a literature search for data on the effects of acceleration on unrestrained passengers, review and refinement of a large accident data base, testing of boat/engine combinations, and analysis of the results of all these activities, The conclusion of the study is that an alternative formula using maximum speed, a turn severity measure derived from slenderness ratio and hull shape, and the relationship of these two factors to one enother is an accurate predictor of the severity of lateral accelerations given a particular boat/engine combination, Further analysis and testing s recommended to validate the formula against a larger data set and to refine it to possibly include a predictor of cyclic instability.

536,348
AD-A153 872/7/GAR PC A06/MF A01
Naval Postgraduate School, Monterey, CA.
Development of Criteria for Automatic Steering.
Master's thesis,
P. Kyritsis-Spyromilios. Dec 84, 122p

The effect of added resistance due to steering on a high-speed containership is propulsion reduction. Limitation on the propulsion losses can be achieved by a properly designed controller, which minimizes the rudder activity as well as providing desired oversees heading. A computer program, simulating a cascade configuration of the SL-7 high-speed containership along with a specific controller was coupled to a function minimization subroutine as well as a sea state generator subroutine in order to minimize criterion. The entire model was tested for a fixed speed, several encounter frequencies, several encounter angles in calm waters and in a seaway as well. Originator-supplied keywords: Regular seas, Irregular seas, Controller design, Encounter frequency, Encounter angle, Yaw, Rudder, BOXPLX subroutine.

536,349
PB85-192060/GAR PC A03/MF A01
Rhode Island Univ., Kingston. International Center for Marine Resource Development.
Plywood Workboats for Small Scale Fisheries,
T. C. Visel, and W. H. Highsmith. 1982, 50p AID-PN-AAN-485
Grant AID/DSAN-G-0116

Because expense and lack of supporting technology and skilled labor often preclude using steel or fiberglass to build the small, inshore fishing vessels used in developing country artisanal fisheries, attention is now being focused on plywood as a basic boatbuilding material. This practical manual presents a detailed description, illustrated with diagrams and photographs, of the plywood skiffs made at Brockway Boat Works in Connecticut. These vessels are inexpensive, versatile, and easy to maintain; they run mainly on low horsepower outboard motors, and their flat-bottomed design saves on fuel consumption and affords maneuverability. Included are lists of necessary materials and tools, and plans for both a trolling and an outboard skiff.

536,350
PB85-861557/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Shipbuilding and Shipping Industries: Government Regulations. 1974-January 1984 (Citations from Oceanic Abstracts).
Rept. for 1974-Jan 84.
Jun 85, 163p
Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning government regulations of shipbuilding and shipping industries. Topics include cargo transportation regulations, shipping and shipbuilding safety standards, marine doctrine, and international relations. Marine insurance and pollution regulations are considered. Risk analysis and legal aspects of shipbuilding industries are presented. (This updated bibliography contains 247 citations, none of which are new entries to the previous edition.)

536,351
PB85-861565/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Shipbuilding and Shipping Industries: Government Regulations. February 1984-May 1985 (Citations from Oceanic Abstracts).
Rept. for Feb 84-May 85.
Jun 85, 99p
Supersedes PB84-857184. Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning government regulations of shipbuilding and shipping industries. Topics include cargo transportation regulations, shipping and shipbuilding safety standards, marine doctrine, and international relations. Marine insurance and pollution regulations are considered. Risk analysis and legal aspects of shipbuilding industries are presented. (This updated bibliography contains 132 citations, all of which are new entries to the previous edition.)

536,352
PB85-861656/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Natural Gas: Marine Transportation. 1974-May 1985 (Citations from Oceanic Abstracts).
Rept. for 1974-May 85.
Jun 85, 189p
Supersedes PB84-858471. Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the design, construction, and operation of ships for the transport of liquified natural gas. Safety devices, equipment used for loading and unloading, and the insulation requirements for tanks are presented. (This updated bibliography contains 299 citations, 23 of which are new entries to the previous edition.)

536,353
PB85-861961/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.

Computer Aided Design and Manufacturing: Naval Architecture. 1970-May 1985 (Citations from the NTIS Data Base).
Rept. for 1970-May 85.
Jun 85, 160p

This bibliography contains citations concerning the use of computers to assist in the design and manufacturing procedures for naval architecture, as used in shipbuilding and ship hull evaluations. Included are interactive techniques and graphic displays for the preparation of engineering drawings. This is one of a series of bibliographies, covering the computer aided design and manufacturing for optical components, printed and integrated circuits, aerospace industry, construction industry, and manufacturing industry. (Contains 185 citations fully indexed and including a title list.)

536,354
PB85-862134/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Shipboard Fires. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 193p
Supersedes PB84-867282.

This bibliography contains citations concerning marine shipboard fires. Topics include sophisticated firefighting techniques; automated detection systems for heat, smoke, and combustion; automated extinguishing systems; and fire resistant materials for shipboard applications. Marine vessels in the commerical, industrial, naval, and private sectors are discussed. (This updated bibliography contains 209 citations, 16 of which are new entries to the previous edition.)

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

536,355
DE85700369/GAR PC **A04**/MF **A01**
Commission of the European Communities, Luxembourg.
Retention Factor for Droplets and Solid Particles of a Glass Fiber Package Filter.
J. Furrer, and A. Linek. 1984, 55p EUR-9105
In German.
U.S. Sales Only.

In the tests performed the packed fiber mist eliminator which is cleanable and intended for use in the offgases of reprocessing plants proved to be a high efficiency roughing filter protecting subsequent HEPA filters. Thanks to the cleanability of the glass fiber package long service lives are attained before a remotely handled replacement becomes necessary. The service life of downstream HEPA filters is increased by at least a factor 10. Experiments performed in the prototype PASSAT dissolver offgas filter section resulted in an optimum thickness of the filter layers of 50 mm and a density of packing of 300 kg/m exp 3 for low differential pressures of 13.2 mbar and volumetric flow rates of 150 m exp 3 (N)/h. Retention factors of 5.10 exp 2 to 10 exp 6 were determined for droplets of 1.5 to 6 mu m diameter whilst the retention factors for sodium fluorescein of a mean geometric particle diameter of 0.12 mu m are > 10 exp 3 . A sufficiently regular loading extending inter alia the service life of a mist eliminator was detected on the surface available for removal. Cleaning tests with the spray nozzles installed have shown that the mist eliminator exposed to Ba-139 (NO sub 3) sub 2 droplets exhibited no more radioactivity in the discharged liquid after a single cleaning step of 15 minutes duration. In case of filter replacement liquid dropping possibly leading to contamination can be avoided during posting out provided that the filter unit is dried before. When the droplet separators (wave plate droplet separator and packed fiber mist eliminator) were combined with the following HEPA filter, total retention factors of > = 2.10 exp 7 were determined in tests involving solvent droplets of 4 mu m mean geometric diameter. (Atomindex citation 16:001640)

536,356
PB85-194892/GAR PC **A07**/MF **A01**
Water and Sanitation for Health Project, Arlington, VA.
Evaluation of the Feasibility of Manufacturing and Marketing the A.I.D. (Agency for International Development)-Design Handpump and Roboscreen in Peru.
Field rept.
Jun 83, 131p WASH/FIELD-89, AID-PN-AAN-734
Contract AID/DSPE-C-0080

The feasibility of manufacturing and marketing an AID-designed handpump and roboscreen (a plastic well screen) in Peru is assessed. After indicating Peru's need for water supply programs, the report describes A.I.D.'s handpump and technology transfer programs and the problems involved in local manufacture of handpumps. Suceeding chapters treat: governmental, sociocultural, and other in-country factors involved in implementing a handpump program; the potential demand for handpumps; elements to be included in a marketing study for the handpump; and handpump installation requirements/constraints. Peru's handpump manufacturing capabilities are then analyzed in greater detail.

536,357
PB85-861441/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pumps for Papermaking and Pulping. 1976-June 1985 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Jun 85.
Jun 85, 163p
Supersedes PB84-858638.

This bibliography contains citations concerning the development, design, construction, operation, performance and applications for pulp and sludge pumps in the pulp and paper industry. Energy consumption, pump capacities, recommended pulp suspension consistencies, impellers, pump classifications, and pump maintenance are among the topics discussed. Pump corrosion and criteria for proper pump selection are also included. (This updated bibliography contains 220 citations, 60 of which are new entries to the previous edition.)

13L. Safety Engineering

536,358
AD-A153 577/2/GAR PC **A03**/MF **A01**
Federal Aviation Administration Technical Center, Atlantic City, NJ.
Suppression and Control of Class C Cargo Compartments Fires.
Final rept. Aug 83-Jun 84,
D. R. Blake. Feb 85, 33p Rept no. DOT/FAA/CT-84/21

A total of 23 fire tests were conducted in a 2357-cubic foot simulated class C cargo compartment. Various lining materials, fire sources, loading configurations, and smoke detectors were used to determine the ability of class C cargo compartments to control fires. The simulated class C cargo compartment did not successfully control the test fires in all cases. The major conclusion of this study is that the 45 degrees bunsen burner test specified in FAR 25.855 does not assure that cargo liners will not burn through when subjected to realistic fires.

536,359
PB85-185734/GAR PC **A05**/MF **A01**
Chi Associates, Inc., Arlington, VA.
Crash Victim Simulator, Testing and Improvement.
Final rept. Apr 82-Apr 83,
B. Aghevli, and M. Chi. May 83, 81p DOT-HS-806-444
Contract DTNH22-80-C-07455
Portions of this document are not fully legible.

This report describes the work using the Crash Victim Simulator (CVS) program to perform a series of simulations of vehicle occupants and pedestrian impacts. Four tasks were included in the contract. For each task, the steps undertaken to carry it out; problems encountered in the course of the task; analyses of the output of the simulations run as part of the task; are all described. A set of recommendations based on the experience with the CVS program are also presented.

536,360
PB85-192854/GAR PC **A04**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Recommended Emergency Preparedness Guidelines for Rail Transit Systems.
Final rept. Apr 82-Mar 84,
W. T. Hathaway, S. H. Markos, and R. J. Pawlak. Mar 85, 54p DOT-TSC-UMTA-84-26, UMTA-MA-06-0152-85-1
Grant DOT-UMTA-MA-06-0152

Four major areas of emergency preparedness are addressed. The first section presents recommendations for Emergency Plan Development, including emergency response procedures, agreements with emergency organizations, and supporting documentation. The Training section outlines recommended training for both transit system and emergency response personnel, as well as programs to promote public awareness. The last two sections--Facilities and Equipment and Vehicles--focus on performance requirements and emergency equipment recommendations to facilitate passenger evacuation and minimize transit property damage.

536,361
PB85-193880/GAR PC **A06**/MF **A01**
Goodell-Grivas, Inc., Southfield, MI.
Restraint System Usage in the Traffic Population, Annual Report, 1984,
M. E. Goryl, and M. J. Cynecki. Mar 85, 115p DOT-HS-806 714
Contract DTNH22-82-C-07126
See also PB85-102838.

This report presents findings from four independent studies on occupant restraint use for various segments of the traffic population. Field observations were collected in 19 U.S. cities from January through December, 1984. Studies were done on the following: Driver safety belt use; Passenger safety belt and child safety seat use; Safety seat installation characteristics; and Helmet use by operators and passengers of motorcycles and mopeds.

536,362
PB85-199545/GAR PC **A99**/MF **A01**
National Bureau of Standards (NEL), Gaithersburg, MD. Center for Fire Research.
Proceedings of the Joint Panel Meeting of the UJNR Panel on Fire Research and Safety (7th) Held at Gaithersburg, Maryland on October 24-28, 1983,
N. H. Jason, and K. Davis. Mar 85, 652p NBSIR-85/3118
See also N84-13341.

The 7th Joint Panel Meeting of the United States-Japan Panel on Fire Research and Safety was held jointly with the Combustion Toxicity and 2nd Expert Meeting of the U.S.-Japan-Canada Cooperative Research Group on Toxicity of Combustion Products from Building Materials and Interior Goods at the National Bureau of Standards, Gaithersburg, Maryland, October 24-28, 1983. Technical sessions were in the areas of: Fire Hazard/Risk Management Methods; Fire Growth Prediction; Materials Fire Properties and Test Methods; Measurement Methods; Combustion Toxicity. Progress reports were presented in each area, in addition to state-of-the-art papers. The next conference will be held in Japan in May 1985.

536,363
PB85-917202/GAR PC **A04**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad Accident Reports - Brief Format, Issue Number 2, 1983.
1985, 59p NTSB/RAB-85/02
Paper copy also available on subscription, North American Continent price $55.00/year; all others write for quote.

This publication contains briefs of selected railroad accidents occurring in U.S. Railroad operations during calendar 1981. The brief format presents basic facts, conditions, circumstances, and probable cause(s) in each instance. Additional statistical information is tabulated by types of accidents and casualties related to types of accidents, carriers involved, and causal factors.

13M. Structural Engineering

536,364
AD-A153 576/4/GAR PC A03/MF A01
Tennessee Univ., Knoxville.
Constitutive Modeling for Blast-Induced Wave Propagation.
Final rept. Jun-Sep 84,
E. C. Drumm. Mar 85, 27p AFESC/ESL-TR-84-45
Contract F49620-82-C-0035

The description of stress-time history acting on a buried structure is a major source of error in the analysis of underground structures to weapons loadings. The stress wave propagating spherically from the weapon is attenuated as it travels from the source. This attenuation is a function of the inelastic response of the soil, and results in an increase in the loading rise time or decrease in the loading rate. Since the inelastic soil response is a function of the loading rate, a wave propagation analysis should be conducted to determine the stresses on the structure. At the interface between the soil and structure, the stress is modified further by soil-structure interaction effects. Thus, the stress on the structure is a function of both the structural and soil properties as well as the distance traveled by the stress wave. These related phenomena can be included in a numerical analysis, but the accuracy depends on the constitutive representation of the materials. One-dimensional wave propagation experiments and impact tests with various soils are reviewed, and the attenuation as a function of the soil stress-strain response is discussed.

536,365
PB85-183747/GAR PC A05/MF A01
California State Dept. of Transportation, Sacramento. Office of Transportation Lab.
Sediment Basins with Slotted Riser Outlets: An Evaluation.
Interim rept. 1978-83,
J. A. Racin, and D. M. Parks. Apr 84, 87p TL-504165, FHWA/CA/TL-84/12
Errata sheet inserted.

An evaluation of sediment basins formed by installing slotted risers on existing highway culvert inlets along State Route 299 in Trinity County, near Redding, California is documented. Grain sizes of the sediment retained in the basins and of sediment that passed through the slotted risers during storms were measured. The sediment is decomposed granite. The volume of retained sediment was measured four times from the time the basins were built in 1978 to 1983. Hydraulic operating characteristics were observed during two storms in January, 1983. This is a follow-up study to a previous Caltrans project entitled 'Sediment Accumulation at Highway Culverts Modified with a Slotted Pipe Riser on Inlet'.

536,366
PB85-186245/GAR PC E03/MF E03
Technische Univ., Vienna (Austria). Inst. fuer Statistik und Wahrscheinlichkeitstheorie.
Continuous Inspection of Concrete Structures and Adaption of Decision Rules by Bayesian Methods,
H. Strelec, and R. Viertl. 1979, 11p TS-1983-3

Continuous inspection concerning the carrying behavior of prestressed concrete structures is a suitable policy to reduce the risk of fatal defects. A stochastic method for such an inspection using a nonlinear model for strain characteristics will be described which makes it possible to consider also knowledge and experience of constructing engineers. A control chart for observed values of strain is derived which helps to decide whether the building is in order or not. An example based on data of bridges of the Vienna underground railway system shows the method at work.

536,367
PB85-186609/GAR PC A11/MF A01
California State Dept. of Transportation, Sacramento. Office of Structures Design.
Proof Testing of a Structural Plate Pipe with Varying Bedding and Backfill Parameters. Section 7. (Volume 3): Finite Element Analysis.
Interim rept.,
Y. Kim, R. E. Davis, and A. E. Bacher. Aug 83, 231p REPT-624160-SECT-7-VOL-3, FHWA/CA/SD-83/04
See also PB83-222810.

The finite element code, CANDE, is used to evaluate the behavior of a 120-in.- (3048-mm-) diameter, 12-gauge, steel, structural, plate culvert under a 188-ft overfill. CANDE is judged to be superior for predicting performance of buried flexible pipes. CANDE results from an asymmetric mesh are compared with results from a CANDE extended, automatic-generated, symmetric mesh for possible economic savings without loss of accuracy of solutions. The results of a CANDE analysis including nonlinear constitutive models for characterizing pipe and soil, incremental construction, allowance of relative movement between soil-pipe and free vertical movement with a symmetric mesh are established, and compared to results of a field experimental study. Lastly, CANDE designs are compared with the California Department of Transportation's design solutions for corrugated steel pipe.

536,368
PB85-186914/GAR PC A09/MF A01
ABAM Engineers, Inc., Federal Way, WA.
Design of Connections for Precast Prestressed Concrete Buildings for the Effects of Earthquake.
Final technical rept.,
D. P. Clough. Mar 85, 180p NSF/ENG-85004

Buildings designed in conformance with typical building code criteria will yield during a significant earthquake. In the present work, a design methodology has been developed which takes into account quantitative estimates of plastic deformations and enables a more rational approach to connection detailing. A simple concept is used to estimate the maximum inelastic displacement at roof level. Results from other investigators are applied to estimate the number of reversed inelastic loading cycles which must be sustained during the response to a damaging earthquake. The design methodology is demonstrated with two example structures typical of precast construction for zones of moderate seismicity in the United States. Strength and deformation requirements derived by this approach are presented for selected joints to facilitate the experimental validation of specific connector designs. Guidelines are presented which enable quantitative comparison of strength, plastic elongation, and cyclic load reversal demands on connectors within similar structures sited in zones of higher seismicity.

536,369
PB85-187334 Not available NTIS
National Bureau of Standards, Boulder, CO. Fracture and Deformation Div.
Acoustoelastic Evaluation of Arbitrary Plane Residual Stress States in Nonhomogeneous, Anisotropic Plates,
R. B. King, and C. M. Fortunko. Nov 83, 3p
Pub. in Ultrasonics 21, n6 p256-258 Nov 83.

In this paper, it is shown that relative ultrasonic velocity measurements can be used to determine the difference of normal stress components in non-homogeneous, anisotropic plates containing arbitrary residual stress states. Previously the theory relating the velocity of Shear-waves to stress and material anisotropy was limited to the case where the principal directions of stress are parallel to the axes of material symmetry. In this paper, the authors remove this restriction by extending the theory. They also suggest possible experimental procedures for validating the new theory.

536,370
PB85-188142/GAR PC A14/MF A01
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Response of Highway Bridges to Nonlinear Temperature Distributions.
Civil engineering studies (Final),
I. C. Potgieter, and W. L. Gamble. Apr 83, 311p UILU-ENG-83-2007, STRUCTURAL RESEARCH SER-505, FHWA/IL/UI-201
Sponsored by Illinois State Dept. of Transportation, Springfield.

The effects of nonlinear temperature distributions resulting from solar radiation on highway bridge decks are investigated. A finite-difference heat flow-model was developed and used to determine the distributions of temperatures to be expected in various highway bridge structures, and the general validity of the model was established by means of comparisons between measured and predicted temperature distributions in the Kishwaukee River Bridge, a large box girder structure. Weather data from 26 stations in the United States were studied in order to determine the limiting values of probable temperature differences over the depths of girders in different geographical regions. The bending moments induced in various continuous bridges were studied, with the aim of isolating the most critical cases. Recommendations about design are made, as are recommendations for additional study of some factors relating to the design process.

536,371
PB85-189819/GAR PC A07/MF A01
California State Dept. of Transportation, Sacramento. Office of Structures Design.
Rigid Pipe Proof Testing Under Excess Overfills with Varying Backfill Parameters. Section 7. (Volume 2): Finite Element Analysis.
Interim rept.,
P. Roschke, O. Bamgboye, E. Carlson, R. E. Davis, and A. E. Bacher. Jun 83, 126p REPT-624175-SECT-7-VOL-2, FHWA/CA/SD-83/02
See also PB83-189852 and PB85-189827.

A finite element analysis of an 84-inch reinforced concrete culvert under approximately 190 ft (58 m) of embankment, made with full consideration for asymmetric canyon boundaries (see Section VII, Volume 1), is repeated for the five zones previously analyzed using a greatly simplified, symmetric, rectangular mesh. The objective of this additional work is to establish comparisons between parameters significantly affecting culvert behavior, as predicted by the complex and simplified analyses. The simplified analysis and comparative predictions are discussed in this volume.

536,372
PB85-189827/GAR PC A08/MF A01
California State Dept. of Transportation, Sacramento. Office of Structures Design.
Rigid Pipe Proof Testing Under Excess Overfills with Varying Backfill Parameters. Section 7. (Volume 3): Neutral Point Analysis Using Finite Element and Observed Tractions.
Interim rept.,
O. Bamgboye, E. Carlson, F. Semans, P. Roschke, and R. E. Davis. Jun 83, 172p REPT-624175-SECT-7-VOL-3, FHWA/CA/SD-83/03
See also PB83-189852 and PB85-189819.

Normal and tangential soil tractions acting on the external periphery of an 84-in reinforced concrete pipe at Cross Canyon have been measured experimentally (see Section II) and derived by finite element analyses using: (1) a full mesh considering canyon wall boundary conditions and presence of a second pipe (see Section VII, Volume 1); and (2) a greatly simplified, symmetrical, rectangular mesh with no second pipe (see Section VII, Volume 2). In this volume are discussed results of inputting to the neutral point analysis (see Section V, Volume 1) tractions derived from field measurements and from the two levels of finite element analysis. Various output parameters and maximum pipe stresses are compared among the three outputs for relative validity.

536,373
PB85-861854/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Bridges: Construction and Construction Materials. 1978-June 1985 (Citations from the NTIS Data Base).
Rept. for 1978-Jun 85.
Jun 85, 163p
Supersedes PB83-807131.

This bibliography contains citations concerning materials and methods utilized in bridge construction. Topics include structural analyses, inspection and maintenance aspects, bridge renovation, and materials studies and evaluations. Studies performed at specific sites, and the use of computer analysis in the design of bridges are discussed. Corrosion studies, and fatigue tests performed on specific structural designs are also considered. (This updated bibliography contains 183 citations, 41 of which are new entries to the previous edition.)

14. METHODS AND EQUIPMENT

14A. Cost Effectiveness

536,374
AD-A153 573/1/GAR PC **A03**/MF **A01**
Army Armament Munitions and Chemical Command, Dover, NJ. Cost Analysis Directorate.
Termination Liability Curve Study.
Final rept.,
R. E. Ayers. Dec 84, 44p Rept no. AMSMC-CAR-85-01

This study provides the results of analyzing cumulative cost incurred patterns from a cross-section of armament and ammunition orders from Headquarters, Armament, Munitions, and Chemical Command. The study was performed to develop a termination liability curve to cover the costs incurred by the Government in the event of contract cancellation of an order in production. This study represents an update of previous efforts in this area. Particular emphasis was given to items which are known to be common Foreign Military Sales items. This document provides composite regression plots for ammunition items and for armament items. Also provided are study assumptions and methodology along with a breakdown of the samples used.

14B. Laboratories, Test Facilities, and Test Equipment

536,375
AD-A153 412/2 Not available NTIS
New Orleans Univ., LA. Dept. of Chemistry.
Coated Piezoelectric Crystal Detector for Phosgene,
A. Suleiman, and G. G. Guilbault. 1984, 7p ARO-17654.1-CH
Contract DAAG29-81-K-0094, Grant DAAG29-77-G-0226
Availability: Pub. in Analytica Chimica Acta, p97-102 1984 (No copies furnished by DTIC/NTIS).

There has been considerable interest in recent years in the application of piezoelectric crystal resonators for monitoring thin films and for studying absorption processes. The linear relationship between the mass added to the crystal surface and the change in frequency can be derived from the Sauerbrey equation. A piezoelectric quartz crystal coated with methyltrioctylphosphonium dimethylphosphate was found to be a good detector for phosgene in the air. The coating is sensitive to phosgene in the microgram/1 range and has a reasonably long lifetime. The response curve is linear over the concentration range 5-140 micrograms/1. The coated crystal can be used for more than six weeks without significant loss in sensitivity, provided that high ammonia concentrations are not encountered.

536,376
AD-A153 480/9/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Application of State Estimation to Target Tracking.
Journal article,
C. B. Chang, and J. A. Tabaczynski. Feb 84, 11p JA-5297, ESD-TR-85-056
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Automatic Control, vAC-29 n2 p98-109 Feb 84.

In this paper, we present a survey of problems and solutions in the area of target tracking. The discussion includes design tradeoffs, performance evaluation, and current issues.

536,377
AD-A153 551/7 Not available NTIS
New Orleans Univ., LA. Dept. of Chemistry.
Piezoelectric Crystal Detector for Acetoin,
A. A. Suleiman, E. C. Hahn, G. G. Guilbault, and J. R. Cavanaugh. 1984, 11p ARO-17654.2-CH
Contract DAAG29-81-K-0094
Availability: Pub. in Analytical Letters, v17 nA19 p2205-2211 1984 (No copies furnished by DTIC/NTIS).

A piezoelectric quartz crystal coated tetrabutylphosphonium chloride was found to be a good detector for acetoin. The coating is sensitive in the ppb range and completely reversible. The response curve is linear over a concentration range of 8-120 ppb. The detector can be tuned to give satisfactory response in 30 seconds. The proposed detector possesses good sensitivity and selectiveity, is low in cost and very simple to operate. It can be easily adapted in law enforcement procedures.

536,378
AD-A153 556/6/GAR PC **A04**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Operational Analysis of System Calibration.
Master's thesis,
H. B. Mutlu. Sep 84, 73p

Mathematical models and a computer simulation program written in APL are proposed for studying ways of dealing with mis-calibration. Methodology for assessing the system effectiveness and an approach for optimizing the effectiveness of a calibration program are examined. The application of the theory is discussed and the results of the simulation program are presented. Additional keywords: Drift rate; Cookie-cutter damage function; von Neumann-Gauss diffuse damage function; Vulnerability; Proportion of on-station time; Regression; Transformation., (Author)

536,379
AD-A153 683/8/GAR PC **A03**/MF **A01**
Scientific Research Associates, Inc., Glastonbury, CT.
Numerical Solutions of the Potential Distribution within the Vacuum Region of the FEATRON.
Final rept. Sep 83-Oct 84,
F. Davoudzadeh, D. V. Roscoe, R. C. Buggeln, and H. L. Grubin. Mar 85, 27p Rept no. R85-920020-F
Contract N00014-83-C-0719

This report described the development of a coordinate system generation procedure suitable for use in the numerical prediction of the physical operation of the FEATRON. The suitability of the coordinate system is demonstrated by application to a simplified model of the equations governing charge distribution in the vacuum region of a single FEATRON cell. For this purpose, a solution to Laplace's equation subject to mixed Dirichlet and Neumann boundary conditions is presented. The numerical method used is the Linearized Block Implicit method of Briley and McDonald which is also described.

536,380
AD-A153 716/6/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Integrated Optical Temperature Sensor.
Journal article,
L. M. Johnson, F. J. Leonberger, and G. W. Pratt. 15 Jul 82, 4p JA-5325, ESD-TR-85-068
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v41 n2 p134-136, 15 Jul 82.

An integrated optical temperature sensor requiring no electrical connection and consisting of a parallel array of unequal arm-length waveguide interferometers in LiNbO3 has been designed and the key components have been demonstrated. The optical transmission of each interferometer varies sinusoidally with temperature with a period in inversely proportional to the path length difference between the two arms. This device has a projected range and resolution of >700 C and 0.002 C, respectively, and would be particularly useful in application requiring immunity to electrical noise.

536,381
AD-A153 752/1/GAR PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Surface Acoustic Wave Devices as Chemical Vapor Microsensors.
Interim rept. Oct 82-Oct 83,
H. Wohltjen, A. W. Snow, and N. L. Jarvis. 18 Apr 85, 21p Rept no. NRL-MR-5530

This paper describes some of the operational characteristics and performance limitations of microfabricated sensors for chemical vapors which use surface acoustic wave (SAW) phenomena to probe a vapor sensitive coating. Comparisons are made with bulk wave piezoelectric crystal sensors and key technical challenges for future development of SAW vapor sensors are discussed.

536,382
AD-A153 762/0/GAR PC **A03**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD. Ship Performance Dept.
Description of Wake Survey Rake Calibration Technique and Calibration Results of Rake 4.
Final rept.,
D. R. Mullinix. Mar 85, 37p Rept no. DTNSRDC/SPD-1141-01

The David Taylor Naval Ship R&D Center conducts wake surveys on models of surface ships and submarines on the towing carriages. The device used to measure the velocity field in way of the propeller disc of the model is called a pitot tube rake and is made up of several five-hole pitot tubes. The rake must be calibrated in open water before a wake survey experiment. This report describes the complete rake calibration process including the apparatus, technique and computations and can be used as a reference for any future rake calibrations. The apparatus includes the rake calibration rig, the pressure transducers, the instrumentation, and the mini-computer used to collect the data. The experimental technique to calibrate rakes includes the alignment of the rake, the pressure gage procedures, and the data collection procedure. The computational procedures used to obtain the results from rake calibrations are found in the two appendixes. This report also gives a description of Rake 4 and the results of the Rake 4 calibration. Rake 4 was built primarily for the wake survey experiment on the model for the ARS-50.

536,383
AD-A153 805/7/GAR PC **A02**/MF **A01**
Washington Univ., Seattle. Lab. for Chemometrics.
Chemometric Analysis of Multisensor Arrays.
Interim rept.,
W. P. Carey, K. R. Beebe, E. Sanchez, P. Geladi, and B. R. Kowalski. 15 Apr 85, 22p Rept no. TR-33
Contract N00014-75-C-0536

A discussion of multivariate calibration techniques and their possible application to sensor array data is reviewed. The progression from multiple linear regression, and principal components regression, to partial least squares can be described by the analysis of their respective algorithms and the data analysis of their respective algorithms and the data analysis problems each of them solve. Additional analysis models are introduced to detect underlying background problems for sensor arrays and the ability to quantitate analysis directly by rank annihilation factor analysis when two dimensional data is obtained.

536,384
AD-A153 967/5/GAR PC **A03**/MF **A01**
Arizona Univ., Tucson. Engineering Experiment Station.
Target Identification Using Global and Local Features.
Final rept. 23 Sep 83-23 Mar 85,
D. G. Dudley. 11 Mar 85, 50p
Contract N00019-83-C-0362

This report is concerned with input-output from an electromagnetic process. The input is a component of the field generated by the experimenter. The output is a component of the field scattered by an object. The goal is to determine, from the data, characteristics of the scatterer. We consider both complex exponential (global) and ray-optic (load) modeling. We report results from the both simulated data and experimental data obtained on the transient ranges at NOSC and Lawrence Livermore National Laboratory. In complex exponential modeling, we conclude that pole identification can be accomplished to a high degree of accuracy. Relating these data poles to complex reson-

ances of the scatterer, however, is limited to high-Q cases in a low noise environment. Our results in ray-optic modeling are preliminary. We find serious difficulties in discriminating between smooth objects with the same radius of curvature and between identifical objects with different curvatures.

536,385
DE85009500/GAR PC **A02**/MF **A01**
Rockwell International, Golden, CO. Rocky Flats Plant.
Proving Ring Calibrations Using a Deadweight Pressure System.
J. P. Affatica, and A. L. Grable. 25 Feb 85, 15p RFP-3677
Contract AC04-76DP03533

The Rocky Flats Standards Laboratory has devised a method to utilize a deadweight pressure gage to calibrate proving rings to 1050 pounds of force (lbf). The equipment and the necessary modifications are described, as is the setup and operation. The modifications are additions to the main structure of the pressure gage allowing direct force measurements without damaging or permanently altering the pressure gage. Also included are a brief description of the computer program used with the system and an error analysis of the system. This development has increased the Standards Laboratory capabilities; previously, proving rings to be calibrated were sent to the National Bureau of Standards or the Primary Standards Laboratory. (ERA citation 10:023046)

536,386
DE85009663/GAR PC **A04**/MF **A01**
Argonne National Lab., IL.
Development of a Methane Monitor Meeting the Bureau of Mines' Intrinsically Safe Mine Monitoring System (ISMMS) Requirements.
T. Otagawa, S. Zaromb, and J. R. Stetter. Sep 84, 59p ANL/ES-144
Contract W-31-109-ENG-38

A low-current methane monitor was constructed that meets the Bureau of Mines' Intrinsically Safe Mine Monitoring System (ISMMS) requirements. Methane is directly oxidized using a highly oxidizing working-electrode potential and a nonaqueous electrolyte. The output of the two sensors is balanced to compensate for background current variations. The response of the monitor is substantially proportional to methane concentration over 0 to 100% methane. The best sensitivity and stability were obtained with an electrode composed of platinum black with a 35 wt % Teflon dispersion deposited on a porous Teflon membrane in contact with 2 M NaClO sub 4 in gamma -butyrolactone. A working-electrode potential of 800 mV versus Ag/AgCl gave the best sensitivity and stability at various relative humidities, whereas a potential of 600 mV versus Ag/AgCl gave the highest signal-to-background-current ratio. The best wicks combined a sintered glass disk and glass fiber filters. The response time is less than 1 min to 90% of signal at a flow rate of 100 cm exp 3 / min. Concentrations as low as 0.6% methane in air could be distinguished from background. The sensitivity and background current of the sensors depend on temperature, with large changes in temperature causing a drift in the background current. 23 references, 27 figures, 10 tables. (ERA citation 10:022362)

536,387
DE85700258/GAR PC **A02**/MF **A01**
UKAEA, Winfrith (England). Atomic Energy Establishment.
Analytical Chemistry Section of Chemistry Research Group, Winfrith. Report for 1982 and 1983.
M. D. H. Amey, P. D. Capp, and H. James. Jan 84, 24p AEEW-R-1739
U.S. Sales Only.

This report reviews the principal activities of the Analytical Chemistry Section of Chemistry Research Group, Winfrith, during 1982 and 1983. The objectives of the report are to outline the range of chemical analysis support services available at Winfrith, indicate the research areas from which samples currently originate, and identify instrumental techniques where significant updating has occurred. (Atomindex citation 15:069322)

536,388
DE85700417/GAR PC **A16**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Nuclear Electronics Laboratory Manual.
May 84, 369p IAEA-TECDOC-309
U.S. Sales Only.

The Nuclear Electronics Laboratory Manual is a joint product of several electronics experts who have been associated with IAEA activity in this field for many years. The manual does not include experiments of a basic nature, such as characteristics of different active electronics components. It starts by introducing small electronics blocks, employing one or more active components. The most demanding exercises instruct a student in the design and construction of complete circuits, as used in commercial nuclear instruments. It is expected that a student who completes all the experiments in the manual should be in a position to design nuclear electronics units and also to understand the functions of advanced commercial instruments which need to be repaired or maintained. The future tasks of nuclear electronics engineers will be increasingly oriented towards designing and building the interfaces between a nuclear experiment and a computer. The manual pays tribute to this development by introducing a number of experiments which illustrate the principles and the technology of interfacing. (Atomindex citation 16:003247)

536,389
DE85700445/GAR PC **A05**/MF **A01**
International Atomic Energy Agency, Seibersdorf (Austria). Labs.
Activities of the IAEA Laboratories, Vienna. Annual Report 1981.
C. B. G. Taylor. Jun 83, 99p IAEA-RL-100
U.S. Sales Only.

The report presents the activities of the IAEA Laboratories at Seibersdorf during the year 1981, with emphasis on the twofold purpose of the Laboratories: to support the Technical Cooperation activities of the Agency, and to operate the Safeguards Analytical Laboratory (SAL). The section dealing with the IAEA Technical Cooperation reports the programs of research where methods developed in Vienna are used throughout the world. Another section deals with the advanced techniques for chemical analysis and the interlaboratory comparisons programme. The training of specialists from member states is also described. The SAL, which became a separate part of the Laboratory, and its role in the Agency's Safeguards programme is also described. Reports and publications of Laboratory members are also listed. (Atomindex citation 16:003624)

536,390
DE85700446/GAR PC **A02**/MF **A01**
International Atomic Energy Agency, Seibersdorf (Austria). Labs.
Activities of the IAEA Laboratories, Vienna. Annual Report 1982.
C. B. G. Taylor. Oct 83, 15p IAEA-RL-105
U.S. Sales Only.

A brief account is given on the main activities of the IAEA Laboratory in Seibersdorf during 1982. The following areas are specified: Plant breeding; Soil science; Entomology; Agrochemicals; Human nutrition; Radiation dosimetry; Electronics; Chemistry; Isotope hydrology; Safeguards Analytical Laboratory (SAL); Health physics. (Atomindex citation 16:003625)

536,391
DE85700447/GAR PC **A05**/MF **A01**
International Atomic Energy Agency, Seibersdorf (Austria). Labs.
Laboratory Activities of the IAEA Laboratories, Vienna. Annual Report 1979.
G. B. Cook. Mar 81, 89p IAEA-RL-78
U.S. Sales Only.

The report gives a fairly comprehensive view of the activities and results of the IAEA Laboratories in Seibersdorf, during the year 1979. These activities are presented under the following main categories: Metrology of the radiations; Dosimetry; Chemistry; Safeguards analytical laboratory; Isotope hydrology; Medical applications; Agriculture: soils; Entomology; Plant breeding; Electronics. (Atomindex citation 16:003626)

536,392
DE85780460/GAR PC **A03**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Apple II -Based Bidimensional Pulse Height Analyser.
J. E. Bateman, A. C. Flesher, R. N. Honeyman, T. E. Pritchard, and W. P. R. Price. Jun 84, 26p RAL-84-036
U.S. Sales Only.

The implementation of a pulse height analyser function in an Apple II microcomputer using minimal purpose built hardware is described. Except for a small interface module the system consists of two suites of software, one giving a conventional one dimensional analysis on a span of 1024 channels, and the other a two dimensional analysis on a 128 x 128 image format. Using the recently introduced ACCELERATOR coprocessor card the system performs with a dead time per event of less than 50 mu S. Full software facilities are provided for display, storage and processing of the data using standard Applesoft BASIC. (Atomindex citation 15:073204)

536,393
DE85780560/GAR PC **A02**/MF **A01**
Istituto Nazionale di Fisica Nucleare, Catania (Italy).
In Situ Thin Film Measurement by X-Rays Induced by 10 KeV-100 KeV Ion Beams.
L. Torrisi, L. Calcagno, A. Trovato, and G. Foti. 1982, 8p INFN/FM-82-1
In Italian.
U.S. Sales Only.

The in situ measurement of thin film thickness between 50 and 100 KeV is described. The method used seems to be flexible enough and can be applied to any type of material. The only parameter intervening in the thickness measurement is the specific energy loss of the proton beams. Film of Al, Cu and Ag have been considered. When the primary beam energy increases the perception in depth of the method grows, reaching 10 mu m with 1 MeV beam. In this case the autoabsorption takes place. (Atomindex citation 15:064866)

536,394
DE85780561/GAR PC **A03**/MF **A01**
Kyoto Univ., Osaka (Japan). Research Reactor Inst.
Microcomputer Applications, (4). The Video Image Processing System with a Z-80 Microcomputer and Its Application to Neutron Radiography.
S. Fujine, K. Yoneda, and K. Kanda. Dec 82, 27p KURRI-TR-230
In Japanese.
U.S. Sales Only.

The high performance video image processing system with a microcomputer has been applied to various fields during recent years. In this paper, a video image processing system with a Z-80 (4MHz clock, 48KB DRAM) microcomputer and its application to neutron radiography are presented. The system has the following peripheral I/O devices; a TTY to control the system, a digital cassette tape recorder and two floppy disk drives to store the programs and the image data, a dot image printer to make a copy of an image on a CRT and a RS-232C interface to communicate with a host computer. The monitor and preliminary image processing softwares were developed with the machine language and stored in EPROMs (2708). The video image signals from the TV camera are digitized with about 33msec conversion-time/frame through a video A/D converter (ADC). The digitized image data can be stored in the image buffer (32KB DRAM) linked through the window address of the microcomputer system. The digitized pictures are taken with 16 levels of gray scale and resolved to 240 x 256 picture elements (pixels) on a monochrome CRT and displayed with 16 distinct colors on a RGB video display. The neutron radiography system installed at the E-2 experimental hole of the KUR(Kyoto University Reactor) has been available for some applications in non-destructive testing. To obtain real time radiographic images a video image processing system has been introduced in this facility. The resolution of image was obtained as about 0.5mm by a super high quality X-ray camera using a NE-426 neutron scintillator. The images of a NE-426 on CRT monitors can be observed directly and visually, and so many test samples can be continuously checked for industrial purpose. The direct image of this system could be satisfactory for penetrating the side plates to test MTR type reactor fuels and for the investigation of moving objects. (Atomindex citation 15:064964)

536,395
DE85780719/GAR PC **A07**/MF **A01**
Paris-11 Univ., Orsay (France).
High Count Rate One-Dimensional Position Sensitive Detector and a Data Acquisition System for Time Resolved X-Ray Scattering Studies.
These (D. Ing.),
P. Pernot. 1982, 136p FRNC-TH-1573
In French.

U.S. Sales Only.

A curved multiwire proportional drift chamber has been built as a general purpose instrument for X-ray scattering and X-ray diffraction experiments with synchrotron radiation. This parallaxe-free one-dimensional linear position sensitive detector has a parallel readout with a double hit logic. The data acquisition system, installed as a part of the D11 camera at LURE-DCI, is designed to perform time slicing and cyclic experiments; it has been used with either the fast multiwire chamber or a standard position sensitive detector with delay line readout. (ERA citation 10:014285)

536,396
PAT-APPL-6-699 282/GAR PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Nondestructive Noncontact Device to Characterize Semiconductor Material.
Patent Application,
C. G. Walker, and G. A. Tanton. Filed 7 Feb 85, 7p
AD-D011 659/0
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A semiconductor single crystal wafer is positioned in a magnetic field. A computer initializes the light level and the electronic gain of each detector preamp associated with a fiber optic link from the analyzer. The magnetic field direction would then be reversed by computer command. This would cause a localized change in intensity of light passing through the wafer, due to Faraday Rotation. The resulting change in detector output together with location and wavelength data could be used to compute a map of the wafer. Additional keyword: Patents. (Author)

536,397
PATENT-4 507 602 Not available NTIS
Department of the Air Force, Washington, DC.
Measurement of Permittivity and Permeability of Microwave Materials.
Patent,
D. G. Aguirre. Filed 13 Aug 82, patented 26 Mar 85, 10p AD-D011 656/6, PAT-APPL-6-407 985
Supersedes PAT-APPL-6-407 985, AD-D009 776.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

Using frequency domain techniques, the system measures the complex permittivity and permeability of different materials in Ku band (12.4 to 18 GHz). The measuring system comprises a dual horizontal-plane sectoral horn and sample holder assembly. The two horns are placed month-to-month with the sample holder betwen them. An input signal is supplied to one horn. The reflected signal from the sample comes back out from the same horn, while the transmitted signal goes through the sample and out via the other horn. The signal source is a frequency synthesizer. A network analyzer and a computer are used to determine the complex permittivity and permeability from the transmission and reflection signals. (Author)

536,398
PB85-180164/GAR PC **E06**/MF **E06**
Water Research Centre, Stevenage (England).
Sample Collection Preservation and Storage. Analytical Quality Control in the Harmonised Monitoring Scheme.
Technical rept.
c1984, 28p TR-214

Analytical Quality Control is necessary to establish the accuracy and comparability of results from laboratories contributing to the Department of the Environment Scheme for the Harmonised Monitoring of Inland Fresh Waters in England and Wales, and to the similar scheme operated by the Scottish Development Department in Scotland. The control of sources of error relating to sampling practices or sample storage is an important factor in achieving the required accuracy and comparability of analytical results from all laboratories participating in the Scheme. Sampling practices appear to be generally satisfactory. Attention is drawn to the need to clean sample containers adequately. Sample preservation requires attention in a minority of laboratories for the determination of trace metals and in a larger number of laboratories for mercury. Tests of sample stability, conducted for the determination of ammonia, total oxidised nitrogen and nitrite indicate generally adequate stability for normal periods of storage. Insufficient testing was possible for suspended solids. (Copyright (c) Water Research Center 1984.)

536,399
PB85-182475/GAR PC **E03**/MF **E03**
National Engineering Lab., East Kilbride (Scotland).
Approximation of Two Parameter Weibull Distribution by Rayleigh Distributions for Fatigue Testing,
L. P. Pook. c1984, 24p NEL-694

Predicted lives of engineering structures should be confirmed by fatigue tests on large-scale prototypes under realistic service-loading simulations. Some service loadings approximate to a succession of narrow band random loadings at varying root mean square levels, where the peaks follow the Rayleigh distribution. Often only the long-term distribution of peaks is known. The problem of constructing a sequence of Rayleigh distributions to fit a given long-term distribution of peaks is considered. For convenience, this distribution is taken as a two-parameter Weibull distribution; this is true for some offshore loadings. A satisfactory graphical procedure for fitting Rayleigh distributions to the two-parameter Weibull distribution has been developed, and some examples are given. (Copyright (c) Crown Copyright 1984.)

536,400
PB85-185072/GAR PC **A03**/MF **A01**
Office of Science and Technology Policy, Washington, DC.
Progress Report on Implementing the Recommendations of the White House Science Council's Federal Laboratory Review Panel. Volume 1. Summary Report.
Jul 84, 35p
See also PB85-185080.

The Panel looks at Federal laboratory missions, identifies any systemic impediments to performance, and determine whether this Nation is getting the optimum return on its substantial investment in talent and facilities at the Federal laboratories.

536,401
PB85-185296/GAR PC **A03**/MF **A01**
Bureau of Mines, Albany, OR. Albany Research Center.
Laboratory Wear Testing Capabilities of the Bureau of Mines.
Information circular/1985,
R. Blickensderfer, J. H. Tylczak, and B. W. Madsen. 1985, 43p BUMINES-IC-9001
Library of Congress catalog card no. 84-600209.

The laboratory wear testing capabilities of the Bureau of Mines are described. Wear tests are used to support the Bureau's research efforts towards reducing the wear of equipment used for mining and minerals processing and any wear involving a loss of strategic or critical materials. The emphasis is on abrasive wear because it accounts for most of the wear losses that occur in mining and minerals processing equipment. Spalling wear, caused by repetitive impact in grinding equipment, also is included. Ten abrasive wear tests, including high-stress and low-stress and two-body and three-body conditions, are described: dry-sand, rubber-wheel abrasive wear; Taber Abraser; abrasion resistance of refractory materials; dry-particle erosive wear; elevated-temperature, dry-particle erosive wear; low-angle slurry pot; jaw crusher gouging wear; ball mill wear; pin-on-drum abrasive wear; and high-speed impact gouging. Two repetitive impact tests are described: ball-on-block impact-spalling and ball-on-ball impact-spalling. Test equipment, procedures, and specimens are described, and typical test results are presented and discussed.

536,402
PB85-186161/GAR PC **E03**/MF **E03**
Technische Univ., Vienna (Austria). Inst. fuer Statistik und Wahrscheinlichkeitstheorie.
Estimation of Power-Type Acceleration Functions in Life Testing,
H. Strelec, and R. Viertl. 1971, 11p TS-1983-2

The life time distribution of a certain device depends on the stress S under which it is operating. In many practical cases one can find a relation between the distribution functions F(S1;t) and F(S2;t) under considered stress levels S1 and S2 by a socalled acceleration function (a.f.) a(S1,S2;t) with F(S2;t)=F(S1;a(S1,S2;t)), t>0. A method for estimating an a.f. of power type a(S1,S2;t)=alpha(S1,S2)*t**beta(S1,S2) under multicomponent stress S=(s1,...,sk) is discussed. The techniques are based on results described by the authors in earlier papers. An example shows the application of these methods for a plastic encapsulated IC.

536,403
PB85-186237/GAR PC **E03**/MF **E03**
Technische Univ., Vienna (Austria). Inst. fuer Statistik und Wahrscheinlichkeitstheorie.
Note on Bayesian Methods in Semiparametric Accelerated Life Testing,
R. Viertl. 1980, 13p RIS-1984-1

The relation between stress S and the c.d.f. F(.1S) of the life time in accelerated life testing is described by an acceleration function a(.) fulfilling F(t1S) = F(a(t)1 (S sub u)) for all t = or > 0 where (S sub u) denotes the usual stress. For linear acceleration functions a(t) = alpha.t under certain conditions the acceleration constant alpha(S) as a function of S is given by alpha(S) = C.exp(delta.H(S)) with known H(S). The parameter delta is given by delt = ln alpha sub 1,2/ (H(S sub 2)-H(S sub 1)) where alpha sub 1,2 denotes the acceleration constant in F(t1 (S sub 2)) = F (alpha sub 1,2.t1 (S sub 1)) for t = or > 0 for two accelerating stress levels (S sub 1) < (S sub 2). The unknown quantity alpha sub 1,2 is described by a random quantity (alpha tilde). From an a-priori distribution for (alpha tilde) and two samples T sub 1,1, ..., T sub 1, n and T sub 2,1, ..., T sub 2, n of life times at stress levels (S sub 1) and (S sub 2) respectively, the a-posteriori distribution of (alpha tilde) can be calculated and can be used to construct HPD-regions for the c.d.f. F(.1(S sub u)) of the life time under usual stress (S sub u). An example from a fundamental research project on accelerated life testing for mechanical components is given.

536,404
PB85-187482 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
SQUID Applications to Geophysics.
Final rept.,
J. E. Zimmerman, H. Weinstock, and W. C. Overton. 1981, 4p
Sponsored by Office of Naval Research, Arlington, VA. Pub. in Proceedings of the SQUID Applications to Geophysics Workshop, Los Alamos, New Mexico, June 2-4, 1980, p81-84, 1981.

No alternatives to liquid-helium cryostats for SQUID geomagnetic measurements are presently available, but micro-miniature Joule-Thomson and low-power non-magnetic Stirling cryocoolers are being developed for this and similar purposes. With increasing interest and experimental work on the subject during the past year or two, it is likely that demonstrations of feasibility will occur in the moderately near future, and perhaps even a suitable commercial cryocooler in the next few years.

536,405
PB85-191112/GAR PC **A02**/MF **A01**
Northrop Services, Inc., Research Triangle Park, NC.
Storage Stability of Volatile Organic Compounds in SUMMA (Trade name) Polished Canisters,
J. D. Pleil, K. D. Oliver, and W. A. McClenny. 1985, 12p EPA/600/D-85/075
Contract EPA-68-02-4035

Six-liter volume SUMMA polished canisters were filled with air samples containing certain volatile organic compounds (VOCs) of environmental interest at concentrations at or below 2 ppbv. Samples were periodically withdrawn from the canisters and analyzed using capillary-column gas chromatography with cryogenic sample preconcentration. The study includes analysis periods of one week and one month to determine storage stability. Synthetic VOC samples in humidified zero-grade air and spiked VOC samples in ambient air were tested. Ambient samples were prepared during peak traffic times to obtain typical air mixtures. Most compounds tested exhibited stability in concentration within typical analytical precision. This validates use of these canisters for collection of whole air samples for subsequent determination of ppbv-level VOC concentrations, at least under typical monitoring conditions.

536,406
PB85-191401/GAR PC **A02**/MF **A01**
National Bureau of Standards (NEL), Gaithersburg, MD. Center for Mfg. Engineering.

Interlaboratory Comparison of Force Calibrations Using ASTM (American Society for Testing and Materials) Method E74-74.
Technical note (Final),
R. W. Peterson, L. Jenkins, and R. A. Mitchell. Apr 85, 25p NBS/TN-1211
Also available from Supt. of Docs as SN003-003-02645-0.

A comparison of force calibrations performed by the National Bureau of Standards and 27 other laboratories located in the United States is reported. Force sensors of four different capacities were calibrated in both tension and compression, repeatedly by NBS with deadweight and one time each by the other participating laboratories. The force sensor capacities were 0.5, 5, 20, and 100 klbf (2.2, 22, 89, and 445 kN). Deadweight machines (with and without force multiplication) and force sensor transfer standards (used in a testing machine or a loading frame) were the force standards represented in the study. The force calibration procedure used was Method E74-74 of the American Society for Testing and Materials.

536,407
PB85-191518/GAR PC **A03**/MF **A01**
National Environmental Satellite, Data, and Information Service, Washington, DC.
Advantages of Sounding with the Smaller Detectors of the VISSR Atmospheric Sounder.
Technical memo.,
W. P. Menzel, T. H. Achtor, C. M. Hayden, and W. L. Smith. Jul 84, 30p NOAA-TM-NESDIS-6

Results are presented that show sounding with the small detectors on the VAS (VISSR Atmospheric Sounder) produces more temperature profile retrievals of good quality in partly cloudy conditions than was possible with the large detectors. The increased ability to find clear fields of view outweighs the disadvantage of greater detector noise.

536,408
PB85-192938/GAR PC **E04**/MF **E01**
Israel Atomic Energy Commission, Beersheba. Nuclear Research Center-Negev.
Moire Deflectometry and Its Applications.
A. Livnat, and O. Kafri. May 82, 30p NRCN(AP)-004

Moire deflectometry is an optical technique which enables very precise measurements of deviations of light beams from their straight course, that was developed recently in the Nuclear Research Center- Negev. Using this method one can measure the variation in the refractive indices of various materials and thus it enables to measure very slight variations in the density and temperature of gases or liquids. Minute distortions in specular surfaces can also be measured very similarly. The advantages of this technique over other optical methods, such as interferometry or holography, are its simplicity, the low cost of the required optical components, and its applicability even to such harsh environments as encountered in the industry. A brief review of the technique is given, followed by description of several of its applications. For each application, the advantages and disadvantages of deflectometry are mentioned, and a comparison is made with other common optical techniques.

536,409
PB85-193910/GAR PC **A05**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Geophysical Sciences.
Atmospheric Nitrogen Oxides: Their Detection and Chemistry.
Annual rept. (Final) 1 Jul 83-Aug 84,
D. Davis. Mar 85, 98p CRC-APRAC-CAPA-23-83-01

The primary objectives of this research program are: (1) the development of new instrumental capability for measuring key atmospheric nitrogen species; and (2) the improvement of the understanding of the cycling of atmospheric nitrogen. Two of the pivotal species in the atmospheric cycling of nitrogen are NO and NO2. During the first year of the program, major design changes were made to the ground-based, field-operational two photon/laser-induced fluorescence NO sensor which resulted in two major technological advances in this instrument: (1) the sensitivity was improved by a factor of five; and (2) the ground-based NO system was made aircraft compatible. Aircraft compatibility was considered essential both for the purpose of investigating the NxOy chemistry of clouds and for studying the nighttime NO/NO2/NO3 chemical system. A modified laboratory prototype photofragmentation laser-induced fluorescence NO2 sensor was field-tested during the first year; a still more sensitive sensor to be used in making airborne NO2 measurements is now in the design stage. The field measurements portion of the program during the first year involved both airborne platforms, with sampling occurring over remote Pacific Ocean regions, and ground-based sampling at the Georgia Tech field station.

536,410
PB85-200079/GAR PC **A02**/MF **A01**
National Bureau of Standards, Gaithersburg, MD. Office of Product Standards Policy.
NVLAP (National Voluntary Laboratory Accreditation Program) Assessment and Evaluation Manual,
P. S. Unger. Apr 85, 21p NBSIR-85/3137
See also PB85-178317.

This manual explains the role of an assessor and evaluator under the National Voluntary Laboratory Accreditation Program (NVLAP). Policies, procedures, and techniques for conducting a NVLAP on-site assessment of a testing laboratory are described. Deficiencies (or departures from the accreditation criteria) and the technical evaluation leading to accreditation recommendations are also discussed.

536,411
PB85-202596 Not available NTIS
National Bureau of Standards, Gaithersburg, MD.
Development of a Personal Exposure Monitor for Two Sizes of Inhalable Particulates.
Final rept.,
R. L. McKenzie, D. S. Bright, R. A. Fletcher, and J. A. Hodgeson. 1982, 5p
Pub. in Environment International 8, n1-6 p229-233 1982.

Measurement of personal exposure to ambient level particulate concentrations is often extremely difficult because of a lack of personal exposure monitors capable of collecting measurable quantities within a meaningful sampling period. A new personal exposure monitor for two fractions of inhalable particulates (i.e., the 3-15 micrometers aerodynamic diameter and the <3 micrometers or respirable fraction) has been developed and characterized. This monitor is capable of collecting a sample of each fraction that is quantifiable with ambient concentrations of inhalable/respirable particulates as low as 25 micrograms/cu m in a 24-h sampling period. Wind tunnel tests have been made on the particulate personal exposure monitor to determine sampling efficiency as a function of relative wind speed and orientation with respect to the sampler.

536,412
PB85-860948/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Fluid Flow Measurement Using Elecrtomagnetic Fields. 1973-May 1985 (Citations from FLUIDEX Data Base).
Rept. for 1973-May 85.
Jun 85, 140p
Supersedes PB84-863190.

This bibliography contains citations concerning electromagnetic flowmeters for the measurement of fluid flow. Topics describe the design and principles of construction and operation of electromagnetic flowmeters. Basic design problems are discussed and ways in which these problems are overcome are explained. Applications in various fluid systems are presented. Calibration procedures are included. (This updated bibliography contains 192 citations, 18 of which are new entries to the previous edition.)

536,413
PB85-861755/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Testing of VLSI Circuits. July 1983-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for Jul 83-Jun 85.
Jun 85, 232p
Supersedes PB84-867043.

This bibliography contains citations concerning various techniques and devices for testing VLSI performance or operation and for detecting and analyzing VLSI failure or faults. Both functional and in-circuit testing are discussed. Statistical and practical aspects of testing methods are presented. (This updated bibliography contains 288 citations, 142 of which are new entries to the previous edition.)

536,414
PB85-861789/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Accelerometers. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 265p
Supersedes PB84-868702.

This bibliography contains citations concerning research, design, construction and application of accelerometers for measurement of motion, vibration, medicine, roughness, waves, shear stress, shock, and gravity. (This updated bibliography contains 351 citations, 11 of which are new entries to the previous edition.)

536,415
PB85-862027/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nondestructive Testing of Surfaces, Coatings, and Paints. 1970-June 1985 (Citations from the Engineering Index Data Base).
Rept. for 1970-Jun 85.
Jun 85, 91p
Supersedes PB84-868090.

This bibliography contains citations concerning the technology of nondestructive examination, testing, inspection and evaluation of surfaces and surface coatings. Among the surfaces and protective coatings discussed are paints, plastic coatings, ceramic coatings, surface hardened steels, semiconductor surfaces and nonferrous coatings. Electrical discharge imaging, ultrasonic defectoscopy, and infrared techniques and applications are included. (This updated bibliography contains 128 citations, 23 of which are new entries to the previous edition.)

14C. Recording Devices

536,416
AD-A153 531/9/GAR PC **A04**/MF **A01**
Battelle Columbus Labs., OH.
Design Issues in Video Disc Map Display.
Final rept.,
J. M. Olson. Oct 84, 69p ETL-0362
Contract DAAG29-81-D-0100
Supersedes AD-A149 646.

Contents: Introduction; Video Disc Technology and Vocabulary; Questions of Design; Further Design Work in Video Disc Mapping; The Future of the Video Disc for Map Display; Annotated Bibliography; Map Video Discs: A Listing; The Relationship between Map Area per Frame and Map Legibility; Observations About Type on Video Discs; and Illustrations.

14D. Reliability

536,417
AD-A153 658/0/GAR PC **A04**/MF **A01**
Department of the Air Force, Washington, DC.
USAF R&M (Reliability and Maintainability) Action Plan Development Team. Volume 1.
Final rept.
1 Feb 85, 75p
See also Volume 2, AD-A153 659.

In September 1984, the Secretary and Chief of Staff of the Air Force directed establishment of a team to develop an Action Plan aimed at institutionalizing the Air Force commitment to improved weapon systems reliability and maintainability. This report, published in two volumes, documents the major activities of the R&M Action Plan Development Team with an emphasis on the methodology, findings, and recommendations. Volume I outlines the team's tasking and approach and describes the findings, conclusions and recom-

mendations that led to the development and approval of the Air Force R&M Action Plan, R&M 2000 (Appendix 2). Volume II is a compilation of key background documents that describe in more detail the establishment of the team and the development of its recommendations.

536,418
AD-A153 659/8/GAR PC **A13/MF A01**
Department of the Air Force, Washington, DC.
USAF R&M (Reliability and Maintainability) Action Plan Development Team. Volume 2.
Final rept.
1 Feb 85, 288p
See also Volume 1, AD-A153 658.

In September 1984, the Secretary and Chief of Staff of the Air Force directed establishment of a team to develop an Action Plan aimed at institutionalizing the Air Force comment to improved weapon systems reliability and maintainability. This report, published in two volumes documents the major activities of the R&M Action Plan Development Team with an emphasis the methodology, findings, and recommendations. Volume I outlines the team's tasking and approach and describes the findings, conclusions and recommendations that led to the development and approval of the Air Force R&M Action Plan, R&M 2000 (Appendix 2). Volume II is a compilation of key background documents that describe in more detail the establishment of the team and the development of its recommendations.

536,419
AD-A153 744/8/GAR PC **A14/MF A01**
Martin Marietta Aerospace, Orlando, FL.
Reliability Derating Procedures.
Final technical rept. Feb 83-May 84,
D. J. Eskin, and C. R. McCanless. Dec 84, 308p
RADC-TR-84-254
Contract F30602-83-C-0006

The objectives of this study were the establishment of derating parameters and levels for electronic parts, development of thermal models, creation of temperature verification methods, and the development of the framework leading to the creation of a military standard for derating of parts. The results of this study revealed that derating data on complex devices are difficult to obtain so an alternate approach was used involving failure rate data from MIL-HDBK-217 and specific failure mode information. Thermal models, both internal and nodal, were developedafor six package types and temperature tests results for one of these types were compared to the theoretical value. The comparison was extremely favorable. The objective of the Reliability Derating Procedures program was to develop the framework leading to the creation of a military standard for the derating of electronic and electromechanical devices for Air Force application. Primary areas of investigation were: (1) relationship of case temperatures to junction temperatures, (2) methods of verifying that derating has been accomplished, (3) relationship of reliability to cost, (4) derating standards for complex devices, (5) creation and verification techniques through data collection and testing.

14E. Reprography

536,420
AD-A153 926/1/GAR PC **A16/MF A01**
Army Engineer Topographic Labs., Fort Belvoir, VA.
Air Photo Analysis, Photo Interpretation Logic, and Feature Extraction,
J. N. Rinker, and P. A. Corl. Jun 84, 351p Rept no. ETL-0329

This is a status report about some of the research efforts within the Center for Remote Sensing (CRS) that are associated with image analysis. Emphasis has been placed on the manual procedure of photo analysis, photo interpretation logic, classification schemes, and knowledge based systems. Information derived from other sources and information presented by contributors are acknowledged in the appropriate sections.

536,421
PB85-194751/GAR PC **A06/MF A01**
Library of Congress, Washington, DC. Copyright Office.
Motion Pictures, 1894-1912,
H. L. Walls. 1953, 104p
See also PB85-194777. Library of Congress catalog card no. 53-60033. Errata sheet inserted.

Motion Pictures, 1894-1912, is a catalog of those copyrighted works identified as motion pictures by Howard Lamarr Walls which were produced during the pioneer period of the motion picture industry. Inasmuch as this catalog includes information supplied by Mr. Walls which does not appear in the records of the Copyright Office, it is not considered a part of the regular Catalog of Copyright Entries, Cumulative Series. It supplements, however, the two volumes in the Cumulative Series, Motion Pictures, 1912-1939 and Motion Pictures, 1940-1949. These three volumes, together with the current issues of the Catalog of Copyright Entries, Third Series, Parts 12-13, Motion Pictures and Filmstrips, comprise an unbroken record of the copyright registration of motion pictures and, also, an extensive although incomplete record of motion picture production in the United States through the entire history of the industry.

536,422
PB85-194769/GAR PC **A99/MF A01**
Library of Congress, Washington, DC. Copyright Office.
Motion Pictures, 1940-1949. Catalog of Copyright Entries, Cumulative Series.
1953, 607p
See also PB85-194785. Library of Congress catalog card no. 53-60032.

Motion Pictures, 1940-1949, is a cumulative catalog listing works registered in the Copyright Office in Classes L and M from January 1, 1940, through December 31, 1949. It continues the series of cumulative catalogs which began in 1951 with Motion Pictures, 1912-1939. A third volume, Motion Pictures, 1894-1912, is also being published (though not as a part of the series); it lists works copyrighted prior to 1912 and identified as motion pictures by Howard Lamarr Walls. These three volumes, together with the current issues of the Catalog of Copyright Entries, Third Series, Parts 12-13, Motion Pictures and Filmstrips, comprise an unbroken record of the copyright registration of motion pictures and, also, an extensive although not complete record of motion picture production in the United States through the entire history of the industry.

536,423
PB85-861425/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Laser Printing: Processes and Machinery. 1976-March 1984 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Mar 84.
Jun 85, 203p

This bibliography contains citations concerning laser electrophotography; laser scanners; continuous form printing operations and processes; pre-printing techniques; applications to packaging, labelling, addressing systems and direct mailing; and laser beam imaging. Machine manufacturers; equipment comparisons; machine design, operation, reliability, performance and applications to various sized businesses; and market trends are also included. Platemaking and phototypesetting are excluded from this bibliography. (This updated bibliography contains 294 citations, none of which are new entries to the previous edition.)

536,424
PB85-861433/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Laser Printing: Processes and Machinery. April 1984-June 1985 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for Apr 84-Jun 85.
Jun 85, 79p
Supersedes PB84-863299.

This bibliography contains citations concerning laser electrophotography; laser scanners; continuous form printing operations and processes; pre-printing techniques; applications to packaging, labelling, addressing systems and direct mailing; and laser beam imaging. Machine manufacturers; equipment comparisons; machine design, operation, reliability, performance and applications to various sized businesses; and market trends are also included. Platemaking and phototypesetting are excluded from this bibliography. (This updated bibliography contains 100 citations, all of which are new entries to the previous edition.)

536,425
PB85-861474/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
UV Drying of Printing Inks: Pigment Effects. 1976-June 1985 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Jun 85.
Jun 85, 75p
Supersedes PB84-861129.

This bibliography contains citations concerning the influence that various coloring agents have on the curing of printing inks by ultraviolet radiation. Drying requirements of various pigments, UV cure rates of pigmented coatings compared to clear coatings and varnishes, pigment concentrations, practical applications and problems, storage stability, and disposition of UV curable pigmented inks are presented. UV curing affected by natural and synthetic based inks is also considered. (This updated bibliography contains 97 citations, 10 of which are new entries to the previous edition.)

536,426
PB85-861516/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Computer Controlled Typesetting. 1975-May 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-May 85.
Jun 85, 151p
Supersedes PB84-862135.

This bibliography contains citations concerning the development and processes of computer controlled typesetting. Computer hardware and software, including character encoding methods, storage and generation are discussed. Laser typesetting systems are included. (This updated bibliography contains 225 citations, 51 of which are new entries to the previous edition.)

536,427
PB85-862019/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Ink Jet Printing. 1972-June 1985 (Citations from the Engineering Index Data Base).
Rept. for 1972-Jun 85.
Jun 85, 75p
Supersedes PB84-868660.

This bibliography contains citations concerning physical limitations, comparison of commercial systems, and machine developments that allow printing by such methods as continuous droplet ink jets, impulse jets, ink-on-demand jets, and electrostatically generated ink jets. Carbon copy and ink drying technology for non-impact ink-jet printers are also included. (This updated bibliography contains 121 citations, 25 of which are new entries to the previous edition.)

15.

MILITARY SCIENCES

15A. Antisubmarine Warfare

536,428
AD-A153 610/1/GAR PC **A02/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Planning and Management Div.

Possible Change in Soviet Views on the Prospects for Anti-Submarine Warfare.
Professional paper,
J. M. McConnell. Jan 85, 19p Rept no. CNA-PP-431
Contract N00014-83-C-0725

In the summer of 1982 there was an apparent shift in Soviet views on the future potential for combating submarines. The following points trace the perceived evolution of this shift. (1) From the early 1970s, Soviet emphasis had been on the submarine's great capacity for concealment and the decreasing cost effectiveness of anti-submarine warfare (ASW) as a 'law-governed' trend extending into the foreseeable future; (2) The first sign of a new perspective came in 1979-80; here, the Soviets implied that no significant breakthrough in ASW was expected during the next five-year plan (1981-85), but they did not rule out an effective innovation after that; (3) In 1982, however, the Soviets apparently saw an operational capability arising ahead of this schedule. Using alleged U.S. views as an almost certain surrogate for their own, they indicated that a 'technological break-through' in ASW (possibly nonacoustic and space-based) was imminent, perhaps (this is the best interpretation) before the end of the current planning period in 1985. A new 'law-governed' trend in naval affairs was set out: the growing susceptibility of submarines to detection and the increasing cost effectiveness of ASW; (4) If Moscow is on the verge of a long-range detection capability, then one might want to speculate on the means they would develop for submarine kill. It is conceivable they they might revive the concept, abandoned in the 1970s, of using a submarine-launched ballistic-missile (SLBM) system for hitting mobile targets as sea.

15B. Chemical, Biological, and Radiological Warfare

536,429
AD-A153 658/4/GAR PC **A09/MF A01**
Institute for Defense Analyses, Alexandria, VA.
Implications of Present Knowledge and Past Experience for a Possible Future Chemical/Conventional Conflict.
Final rept.,
G. M. Hammerman. Jan 85, 179p IDA-P-1819, IDA/HQ-85-28955, SBI-AD-E500 710
Contract MDA903-84-C-0031
Prepared in cooperation with Historical Evaluation and Research Organization, Fairfax, VA.

This report is based on papers presented at a CW conference in February 1984 to explore the implications of present knowledge and past experience for a possible future chemical/conventional conflict. The objective of the study was to stimulate new thought on the subject of possible future CW by involving as broad a group as possible. Three areas of research were pursued: the historical experience of past chemical combat; the nature of contemporary and anticipated chemical agents; and the weapons, equipment doctrine, and training which Soviet forces would bring to such warfare.

15C. Defense

536,430
AD-A153 825/5/GAR PC **A03/MF A01**
RAND Corp., Santa Monica, CA.
Rand Winter Study on Nonnuclear Strategic Weapons. Executive Summary.
Interim rept.,
C. Builder, Y. Ben-Horin, T. Brown, R. Darilek, and G. Dennis. Dec 84, 44p Rept no. RAND/N-2227-AF
Contract F49620-82-C-0018

Advancing technologies, particularly in 'smart' microelectronics and manifested in munitions, are offering the future prospect of nonnuclear weapon s capable of performing some of the missions now assigned to strategic nuclear forces. That prospect may be advanced by increasingly voiced concerns about the possession or use of the large stockpiles of strategic nuclear weapons. The emergence of nonnuclear strategic weapons (NNSW), perhaps before the turn of the century, could have profound implications for current security concepts and policies. The purpose of the research reported here was to anticipate as many as possible of those implications and, thereby, improve the basis for U.S. Air Force planning. Current concepts for deterrence and for the waging of strategic and theater warfare were reexamined for the potential changes that might occur as a result of the advent of significant NNSW capabilities. Similarly, current policies for security alliances and for the proliferation and control of nuclear arms were reviewed for the stresses or changes that might accompany the emergence of NNSW. While many of the potential changes in security concepts and policies are so complex as to defy judgments about whether NNSW should be welcomed or rejected, there is little doubt that NNSW are emerging and that they will greatly complicate our ideas about how to prevent or wage wars. The salient uncertainties now, however, are technical: How far can NNSW go in posing alternatives to strategic nuclear weapons.

536,431
AD-A153 920/4/GAR PC **A02/MF A01**
Army Field Artillery School, Fort Sill, OK. Morris Swett Library Div.
Military Exercise, A Bibliography of Periodical Articles.
Final rept.,
L. L. Miller. 19 Apr 85, 12p Rept no. USAFAS/MSTLD/SB111

This bibliography lists military exercises of the US Army and US Marine Corps with empahssis on ground maneuver activities since 1945. Entries are arranged by acronym/codeword. Selection is from the unclassified holdings of this library. No attempt at inclusivess has been attempted. In this respect this is a working draft.

536,432
AD-A154 014/5/GAR PC **A07/MF A01**
Naval Postgraduate School, Monterey, CA.
Sweden: Nato's Silent Partner.
Master's thesis,
J. E. Keys. Dec 84, 136p

In 1949 Sweden elected not to join NATO and declared a security policy which remains in effect today: non-alignment in peace, neutrality in war. To conduct this policy, Sweden must have a credible deterrent. In this context, the defense doctrine is one of 'total defense', in which all aspects of Swedish society (military, civilian, economic) are coordinated in a total effort to ensure the survival of the nation. But the doctrine may not be effective without the support of outside forces, and some Swedish military planners admit that they rely on NATO support within seven days of any outbreak of hostilities with the Warsaw Pact, making Sweden a 'trip-wire' for NATO. This paper examines the Swedish defense doctrine in terms of military force structure, framed in the political debate of the past decade. It discusses the difficulties facing Sweden in regard to modernizing her armed forces, and suggests that Sweden is now, and will continue to be, a silent partner in NATO.

15E. Logistics

536,433
AD-A153 564/0/GAR PC **A03/MF A01**
Logistics Management Inst., Bethesda, MD.
Cost Savings from Multiyear Contracting,
Final rept. Oct 83-Oct 84,
J. S. Domin. Oct 84, 44p Rept no. LMI-RE405
Contract MDA903-81-C-0166

Two multilayer contracts are reviewed to determine the savings that are being realized over the cost of annual contracting for the same work; one is an Army contract with the Sikorsky Aircraft Division of United Technologies Corporation for the UH-60A BLACK HAWK helicopters and the other an Air Force contract with the General Dynamics Corporation for the F-16 multimission fighter aicraft. Significant cost savings are being realized on both programs. The broadening of multiyear contracting to include requirements of all services for the same end items for spares, support equipment, and foreign military sales offers an opportunity to achieve even more cost savings than under the current contracting approach. The criteria for multiyear contracting, which include significant cost savings, stability of requirements and configuration, and confidence in contractor cost performance and capability, are found to be appropriate but vague. After several years of cost experience are accumulated, multiyear contract costs should be compared with those for prior annual contracts for the same systems in order to validate savings and to determine the extent to which engineering and requirements changes reduce them. At that time, the criterion for stability of requirements and configuration should be tightened.

536,434
AD-A153 599/6/GAR MF **E04**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contracts by State, County, Contractor Name, City, FY-79.
Annual rept.
30 Sep 79, 1018p ST-25
Availability: Microfiche copies only.

Documents lists state or foreign country, county, contractor, city or base, dollars of contracts for Army, Navy, Air Force, DLA, OCE. Information in this format is recorded starting FY 66.

536,435
AD-A153 600/2/GAR MF **E04**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contracts by State, County, Contractor Name, City, FY-80.
Annual rept.
30 Sep 80, 1088p ST-25
Availability: Microfiche copies only.

Documents lists state or foreign country, county, contractor, city or base, dollars of contracts for Army, Navy, Air Force, DLA, OCE. Information in this format is recorded starting FY 66.

536,436
AD-A153 601/0/GAR MF **E05**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contracts by State, County, Contractor Name, City, FY-81.
Annual rept.
30 Sep 81, 1213p ST-25
Availability: Microfiche copies only.

Documents lists state or foreign country, county, contractor, city or base, dollars of contracts for Army, Navy, Air Force, DLA, OCE. Information in this format is recorded starting FY 66.

536,437
AD-A153 602/8/GAR MF **E06**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contracts by State, County, Contractor Name, City, FY-82.
Annual rept.
30 Sep 82, 1391p ST-25
Availability: Microfiche copies only.

Documents lists state or foreign country, county, contractor, city or base, dollars of contracts for Army, Navy, Air Force, DLA, OCE. Information in this format is recorded starting FY 66.

536,438
AD-A153 603/6/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Military Prime Contract Awards by State for Fiscal Years 1951 to 1981.
Annual rept.
Dec 81, 34p P-10
Availability: Microfiche copies only.

Tables show net value of military procurement actions by Army/Navy/Air Force, DSA, by Fiscal Year.

536,439
AD-A153 604/4/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Military Prime Contract Awards by State for Fiscal Years 1951 to 1982.
Annual rept.
Dec 82, 35p P-10
Availability: Microfiche copies only.

Tables show net value of military procurement actions by Army/Navy/Air Force, DSA, by Fiscal Year.

536,440
AD-A153 657/2/GAR PC **A03**/MF **A01**
Institute for Defense Analyses, Alexandria, VA.
Cost Estimating Relationships for Air and Sealift Mobility Forces.
Memorandum rept. Nov 83-Sep 84,
N. J. Asher, and W. J. E. Shafer. Mar 85, 44p IDA-M-54, IDA/HQ-84-28597, SBI-AD-E500 712
Contract MDA903-84-C-0031

This document describes the development of cost estimating relationships (CERs) for cargo aircraft and the different types of ships used by U.S. and USSR mobility forces. Both RDT&E and procurement cost CERs are presented for cargo aircraft, but only procurement cost for ships (because RD&T costs for non-combatant ships are relatively minor and are usually embedded in the procurement cost of the ships). The principal purpose for the derivation of these particular CERs is to estimate the costs of the USSR and the U. S. mobility systems in the same consistent manner for relative comparisons, a basic premise in their development being that they contain only those input values and/or parameters that could be estimated based on observable characteristics of USSR systems.

536,441
AD-A153 695/2/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Deployable Core Automated Maintenance System (DCAMS),
D. M. Crippen, S. E. Alten, and J. K. Shaw. Aug 84, 17p AFLMC-LM831215, SBI-AD-F630 671

We examined hardware requirements for development of a Deployable Core Automated Maintenance System (DCAMS). Our six alternatives covered the spectrum from a mainframe computer, the Tactical Shelter System, to the Air Force standard microcomputer, Zenith Z-100. Criteria used for the evaluation looked at ease of maintenance, survivability, physical characteristics, transportability, and compatibility with CAMS. We recommend using a microcomputer network to best satisfy the hardware requirement for DCAMS. Since DCAMS is not funded, we also recommend an interim system be developed by the AFLMC to provide limited support until DCAMS is ready. The system would be developed on the AF standard microcomputer and provide engine tracking, scheduled maintenance requirements, and aircraft status information.

536,442
AD-A153 696/0/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Inventory Policy for High Backorder Items,
D. J. Blazer, and C. Carter. Oct 84, 24p AFLMC-LS840810, SBI-AD-F630 670

In this study the item-by-item performance of the Standard Base Supply System (SBSS) is compared with the results of an aggregate model that minimizes backorders. We found that a small group of relatively inexpensive items generate nearly 90% of the units backordered in the SBSS in a year. By adding a lot size to the reorder point for those high backorder items, we can significantly reduce the number of units backordered. In this study we show how to identify these items, the theory behind the proposed inventory policy change, and the stock fund impact of implementing the policy change.

536,443
AD-A153 697/8/GAR PC **A05**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Local Purchase Support for Overseas Activities,
S. Powell. Mar 82, 83p AFLMC-800903, SBI-AD-F630 626

Long delivery times are experienced for local purchase (LP) items not available in overseas areas. Evaluation of alternative concepts to improve LP support for overseas activities indicates that establishment of overseas LP centers at Robins and McClellan AFBs will improve responsiveness for LP items not available in overseas areas. Estimated O&ST reductions resulting from alternative procedures are given. Projected savings and costs to establish the centers are provided.

536,444
AD-A153 706/7/GAR PC **A03**/MF **A01**
Air Force Logistics Command, Wright-Patterson AFB, OH. Directorate of Management Sciences.
Annual Report 1984 (for the Directorate of Management Sciences of the Air Force Logistics Command, Wright-Patterson AFB, OH).
1984, 48p

The Directorate of Management Sciences of the Air Force Logistics Command (AFLC) (XRS) conducts and sponsors studies and research of significant logistics issues. In 1984 we concentrated on assisting the rest of the staff with analyses that relate logistics resource alternatives to the peacetime readiness and wartime sustainability of AFLC's customers--the operating commands. That focus will continue in 1985 and beyond. This first annual report discusses the capabilities of the XRS organization, its goals for the future, some specific accomplishments in 1984, and our program for 1985.

536,445
AD-A153 709/1/GAR PC **A03**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
EOQ (Economic Order Quantity) Range Model,
D. J. Blazer, W. Faulkner, and M. P. Ham. Jan 85, 47p AFLMC-LS840612, SBI-AD-F630 708

In compliance with DOD Instruction 4140.45, the Air Force implemented range model in December 1981 that was based on economics. This economic range model determines what items to stock at base level, by comparing the cost to stock the item to the cost to not stock the item. The item is stocked if it is economical. In this report we determine the: (a) Performance of the current range model, (b) Sensitivity of the range model to cost, item, and other factors, and (c) Operational, stockage, and cost performance of an alternative method of determining the range of stock for base level. We measured the performance of the current range model and found we had increased the number of line items we stock, but we have not increased the unit issue effectiveness. We also found General Support Division items with large lot sizes and high unit prices have a lower likelihood of stocking with the current range model than they did before the model was implemented. The reason the unit issue effectiveness is low is because the current range model is a customer model; it favors individual customers rather than satisfying the quantity of individual items all customers--large and small--request.

536,446
AD-A153 710/9/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
SBSS (Standard Base Supply System) Data Element Architecture.
Rept. on Phase 4,
D. J. Blazer. Feb 85, 19p AFLMC-LS841045, SBI-AD-F630 710

We have recommended several improvements to existing stockage policy. Our recommendations require data elements, records, and programs over and above the existing system. Prior to Air Force acceptance of the software maintenance of the Phase IV Standard Base Supply System (SBSS), the Data Systems Design Office needs to 'baseline' the system. Since we are recommending changes to the baseline, we were tasked to predict the data elements required for future stockage policy changes. Once the future data elements are identified, the current SBSS' records and data elements can be expanded as necessary and then baselined. We projected the data elements, records, and programs necessary to implement completed, in-work, and future Air Force Logistics Management Center projects. We provided a brief summary of why the data element, record or program is needed. We also identified three areas for stockage policy data requirements: (a) Interface with computers, especially base level microcomputers. (b) An increased need for demand history. (c) Reporting and requirements determination by weapon system. We recommend the Phase IV system be baselined to accommodate our projected system enhancements.

536,447
AD-A153 711/7/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Mobility Operations Base-Level LOGMARS (Logistics Applications of Automated Marking and Reading Symbols) Enhancement (MOBLE),
L. A. Snyder, G. A. Christmas, Dec 84, 14p AFLMC-LX050711, SBI-AD-F630 707

The objective of this study was to streamline the base-level cargo mobility process using source data automation (SDA). MAJCOMs were surveyed, bases visited, and regulations, supplements and base-level mobility plans reviewed to obtain information on the current mobility processes. The surveys revealed the current base-level mobility system to be labor, procedural, and information intensive. This study recommends project MOBLE be used as a blueprint for further mobility development work that will actually lead to implementation.

536,448
AD-A153 712/5/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Mobility Control Center Productivity,
J. O. Holland, L. A. Snyder, M. F. Grandalski, G. C. Edwards, and O. L. Hankins. Apr 84, 17p AFLMC-LX100711, SBI-AD-F630 676

This report addresses the problems impacting mobility control center productivity. The MAJCOMs agree that problems do exist in the areas of training, facilities, communications, and equipment, and that improvements are needed. In addition, a number of MAJCOMs indicated that Mobility Control Center (MCC) productivity improvement is dependent on the interest that commanders have in their mobility program. Improved training, facilities, communications, and equipment will not significantly improve a mobility program without aggressive support from commanders. Commanders, from MAJCOM to unit level, must let their personnel know that mobility is an important part of the mission and demand the full support of every subordinate. Strong command support ensures: (a) An adequate number of qualified, motivated personnel with reasonable retainability are assigned to work in the MCC; (b) Personnel attend training classes; (c) Mobility exercises are frequent enough to achieve and maintain proficiency; and (d) Adequate facilities, communications, and equipment are available for the MCC.

536,449
AD-A153 745/5/GAR PC **A02**/MF **A01**
Air Force Logistics Management Center, Gunter AFS, AL.
Air Freight Terminal MHE (Material Handling Equipment) Requirements Model (4/6K Forklifts).
Final rept.,
D. E. King, B. A. Yost, and W. Faulkner. Dec 84, 18p

We were asked by HQ USAF/LET to develop a method of establishing requirements for light forklifts (4K and 6K) used in air freight terminals. Table of Allowance (TA) 010 prescribes peacetime allowances for 4K and 6K forklifts at air freight terminals. Allowances are determined subjectively. However, contingency and WRM forklift allowances are not addresses in TA 010. The methods currently used to determine allowances in TA 010 and actual requirements can result in the wrong number of light forklifts in our freight terminals. Too few forklifts can contribute to bottlenecks and backlogs. Too many forklifts can needlessly waste resources. We developed a model, on the X-100 microcomputer, to replace the subjective method of determining light forklift requirements. By inputting a range of variables, the local freight terminal manager can describe the specific workload (either peacetime or wartime) and the work environment. The model can also be used by the major command to verify base-level requirements. Contingency planning and waritime requirements can be computed as often as needed to reflect changes in projected cargo flow.

536,450
AD-A153 761/2/GAR PC **A07**/MF **A01**
Harris Corp., Melbourne, FL. Government Information Systems Div.

Prediction of Scheduled and Preventative Maintenance Workload.
Final technical rept.,
R. J. Ritchie, J. C. Notestine, J. S. Schmidt, J. N. Irvin, and C. P. Vaziri. Jan 85, 129p RADC-TR-84-268
Contract F30602-83-C-0066

This report documents the development of new techniques to predict Preventive Maintenance task completion times in relation to system and equipment design characteristics. Data derived from numerous expert maintainers via interviews and a subjective maintenance time estimation process were analyzed. The analysis led to the development of techniques for predicting preventive maintenance down time early in the design process. Two prediction products were developed, one to be used by maintainability engineers during system/equipment validation phase design and one to be used during full scale development phase design. Use of these products was discussed in the context of MIL-HDBK-472 procedures and as a means of reducing system maintenance costs. Keywords: Scheduled/Preventive Maintenance Action(SPMA), and Subjective Estimation.

536,451
AD-A153 778/6/GAR PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Documentation and Evaluation of Depot Maintenance Cost System Coding and Reporting by Department of Defense Depots.
Master's thesis,
H. S. Guess. Dec 84, 86p

The purpose of this research project is to document and examine the coding processes used by depots in accumulating cost data reported to the Office of the Assistant Secretary of Defense for Manpower, Installations, and Logistics (OASD, MI&L). The analysis in this thesis is based on information obtained from on-site visits to the Sacramento Air Logistics Center, Sacramento, Calif. and the Naval Air Rework Facility, North Island, San Diego, Calif. The results of this study indicated that the coding processes used by both depots generate data variations and biases in the OASD (MI&L) Depot Maintenance Cost System. In addition, the study revealed that variations do not occur on a consistent basis and, therefore, methods need to be developed to identify and segregate the effects of different coding processes used by depots. Keywords: DoD cost accounting, DOD 7220.29H, Uniform cost accounting at DOD level, OASD report RCS-00-m(s) 1397.

536,452
AD-A153 802/4/GAR PC **A05**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Pre-Planned Product Improvement: A Better Way of Weapon System Acquisition.
Master's thesis,
P. T. Mackey. Feb 84, 82p Rept no. AFIT-LSSR-64-83

The object of this thesis was to evaluate the acquisition approach called pre-planned product improvement or P3I and the benefits it offers. First a comparison of P3I and a similar concept called Evolutionary Acquisition or EA, was made to improve understanding of P3I and how it relates to EA. It was concluded that EA, as defined, is a Command and Control (C2) specific P3I application. Then, to see if the theorized benefits of P3I actually come about, the cost and schedule performance of a P3I program was compared to that of non-P3I programs. Acquisition lengths were also compared. The comparison found that P3I may indeed lessen acquisition times and enhance cost and schedule performance.

536,453
AD-A153 826/3/GAR PC **A03**/MF **A01**
Williams (Verle A.) and Associates, Inc., San Diego, CA.
Report for Preparation of Guide Specifications for Maintenance Management Systems.
Nov 84, 37p HNDSP-84-098-ED-ME
Contract DACA87-84-C-0012

Maintenance Management Systems (MMSs) applied to DOD facilities will greatly reduce equipment downtime, breakdown repair cost and equipment replacement cost and will increase total facility operation reliability, equipment life and effectiveness of maintenance department personnel--if the system is properly designed and effectively applied with a properly trained staff. The key factors desired by many who are presently operating both an EMCS (Energy Monitoring and Control Systems) and a MMS are: (1) flexibility to add and delete Work Orders (WOs) and equipment; (2) capacity and capability to add functions and equipment as operating personnel become more familiar with the overall capabilities and benefits of the system; and (3) keep the two systems' main processors and terminals separate, except for the 'hook' desired to retrieve certain status information from the EMCS. The effectiveness and usefulness of the MMS is directly related to the willingness of the system designer, supplier, and installer and commissioner to work closely with the facilities operating personnel to integrate the MMS into the facility's operations program.

536,454
AD-A153 829/7/GAR PC **A11**/MF **A01**
Army Research Office, Arlington, VA.
Proceedings of the ARO (Army Research Office) Workshop on Analytical and Computational Issues in Logistics R & D Held at George Washington University, Washington, DC on 7-9 May 1984. Volume 1.
Dec 84, 228p
See also Volume 2, AD-A153 853.

This volume and its companion contain the proceedings of an Army Research Office workshop on logistics research held at the George Washington University on 7-9 May 1984. Contents: ILS (Integrated Logistics Support) Planning Problems for New Weapon Systems; Logistics Support Analysis Techniques Review and Analysis; Logistics Operational Effectiveness Network Analysis; Forecasting Performance for Slow Moving Items; Supporting the Future Force; Overview of Selected Topics in Logistics R&D; Supportability in Operational Test and Evaluation; and ILS Qualification.

536,455
AD-A153 853/7/GAR PC **A10**/MF **A01**
Army Research Office, Arlington, VA.
Proceedings of the ARO (Army Research Office) Workshop on Analytical and Computational Issues in Logistics R & D Held at George Washington University, Washington, DC on 7-9 May 1984. Volume 2.
Dec 84, 203p
See also Volume 1, AD-A153 829.

Contents: Logistics, Stochastic Networks, and Failure Modeling; Optimal Control of Admission, Routing, and Service in Queues and Networks of Queues: A Tutorial Review; Some Recent Advances in Activity Networks; Markov Models of Multi-echelon Repairable-Item Inventory Systems; Studying Model Assumptions in Process Quality Control; Recent Research in Experimental Design for Quality Improvement with Applications to Logistics; Models of Military Combat with Logistics Components; and Overview of Expert Systems.

536,456
AD-A153 885/9/GAR PC **A02**/MF **A01**
Aeronautical Systems Div., Wright-Patterson AFB, OH.
Inventory Adjustment of Government Owned Property in Possession of Government Contractors.
Final rept.,
J. A. O'Donnell, and J. D. Etchemendy. 21 Feb 85, 20p Rept no. ASD-83-092-SEA

The Federal Acquisition Regulation (FAR) and DOD FAR Supplement establish the property administrator's responsibilities regarding missing government property. When government property is found to be missing, the property administrator must review pertinent facts surrounding the lost to determine the contractor's liability, if any, and recommend a course of action for the contracting officer. This paper provides guidance for determining liability.

536,457
AD-A153 909/7/GAR MF **E09**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contracts by Contractor Name, State, City, FY-79.
Annual rept. Oct 78-Sep 79.
30 Sep 79, 2139p
Availability: Microfiche copies only.

Documents lists contractor, city, state or foreign country, dollars of contracts for Army, Navy, Air Force, DLA, OCE. Information in this format is recorded starting FY 66.

536,458
AD-A153 910/5/GAR MF **E09**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contracts by Contractor Name, State, City, FY-80.
Annual rept. Oct 79-Sep 80.
30 Sep 80, 2296p
Availability: Microfiche copies only.

Documents lists contractor, city, state or foreign country, dollars of contracts for Army, Navy, Air Force, DLA, OCE. Information in this format is recorded starting FY 66.

536,459
AD-A153 928/7/GAR PC **A02**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
First Destination Transportation (FDT) Cost Model.
Final rept.,
C. Ash. Apr 85, 14p Rept no. DTNSRDC-85/013

The objective of this study was to develop a model that would forecast First Destination Transportation (FDT) costs for transportation budgeting purposes. naval personnel from both Naval Supply Systems Command (NAVSUP) and David W. Taylor Naval Ship Research and Development Center (DNTSRDC) made a study of the Air Force's methodology for forecasting its FDT requirements. Actually, the required criteria for the Navy FDT forecasting requirements closely parallel those of the Air Force. Thus, the Air Force method could be adapted to Navy use if the required data were available. The Air Force methodology is computer programmed. The program incorporates past and projected procurement data coupled with presently used transportation data.

536,460
AD-A153 957/6/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Educational and Nonprofit Institutions Receiving Department of Defense Prime Contract Awards for RDT&E, Fiscal Year 1978.
Annual rept.
26 Jun 79, 13p
Availability: Microfiche copies only.

This DIOR report provides information on DoD prime contract awards to educational and nonprofit institutions. This data is shown in sections organized by awards to: Educational and other nonprofit institutions in the U.S.; U.S. government agencies receiving DoD prime contract awards; foreign institutions and government agencies receiving DoD prime contract awards. Early reports are arranged alphabetically by institution.

536,461
AD-A153 958/4/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Educational and Nonprofit Institutions Receiving Department of Defense Prime Contract Awards for RDT&E, Fiscal Year 1979.
Annual rept.
4 Mar 80, 12p
Availability: Microfiche copies only.

This DIOR report provides information on DoD prime contract awards to educational and nonprofit institutions. This data is shown in sections organized by awards to: Educational and other nonprofit institutions in the U.S.; U.S. government agencies receiving DoD prime contract awards; foreign institutions and government agencies receiving DoD prime contract awards. Early reports are arranged alphabetically by institution.

536,462
AD-A153 959/2/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Educational and Nonprofit Institutions Receiving Department of Defense Prime Contract Awards for RDT&E, Fiscal Year 1980.
Annual rept.
1980, 13p
Availability: Microfiche copies only.

This DIOR report provides information on DoD prime contract awards to educational and nonprofit institutions. This data is shown in sections organized by awards to: Educational and other nonprofit institutions in the U.S.; U.S. government agencies receiving DoD prime contract awards; foreign institutions and government agencies receiving DoD prime contract awards. Early reports are arranged alphabetically by institution.

536,463
AD-A153 960/0/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Educational and Nonprofit Institutions Receiving Department of Defense Prime Contract Awards for RDT&E, Fiscal Year 1981.
Annual rept.
Feb 82, 13p
Availability: Microfiche copies only.

This DIOR report provides information on DoD prime contract awards to educational and nonprofit institutions. This data is shown in sections organized by awards to: Educational and other nonprofit institutions in the U.S.; U.S. government agencies receiving DoD prime contract awards; foreign institutions and government agencies receiving DoD prime contract awards. Early reports are arranged alphabetically by institution.

536,464
AD-A153 961/8/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Educational and Nonprofit Institutions Receiving Department of Defense Prime Contract Awards for RDT&E, Fiscal Year 1982.
Annual rept.
1982, 16p
Availability: Microfiche copies only.

This DIOR report provides information on DoD prime contract awards to educational and nonprofit institutions. This data is shown in sections organized by awards to: Educational and other nonprofit institutions in the U.S.; U.S. government agencies receiving DoD prime contract awards; foreign institutions and government agencies receiving DoD prime contract awards. Early reports are arranged alphabetically by institution.

536,465
AD-A153 972/5/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Size Distribution, Fiscal Year 1978.
Annual rept.
20 Mar 79, 14p
Availability: Microfiche copies only.

This report provides data on prime contract actions over $10,000 (500,000 for older years) awarded by the Department of Defense. For reporting purposes, contracts have been distributed by dollar value into 11 different size categories. The tables provide information on the number of total actions, their net value, and their percent distribution by size and according to a variety of categories, including awarding agency, type of contract involved, type of contract action taken, and competitive status. Table 1 presents data by individual size category (e.g., $10,000 to $24,000; $25,000 to $49,000), while Tables 2 through 5 present data in cumulative categories (e.g., $10,000 or more; $25,000 or more). This information assists DoD management in projecting the workload that will be required by various proposed projects. These data can also be used to identify trends in DoD procurement, e.g., to identify which one of the various types of contracts was most frequently awarded.

536,466
AD-A153 973/3/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Size Distribution, Fiscal Year 1979.
Annual rept.
15 Jun 80, 16p
Availability: Microfiche copies only.

This report provides data on prime contract actions over $10,000 (500,000 for older years) awarded by the Department of Defense. For reporting purposes, contracts have been distributed by dollar value into 11 different size categories. The tables provide information on the number of total actions, their net value, and their percent distribution by size and according to a variety of categories, including awarding agency, type of contract involved, type of contract action taken, and competitive status. Table 1 presents data by individual size category (e.g., $10,000 to $24,000; $25,000 to $49,000), while Tables 2 through 5 present data in cumulative categories (e.g., $10,000 or more; $25,000 or more). This information assists DoD management in projecting the workload that will be required by various proposed projects. These data can also be used to identify trends in DoD procurement, e.g., to identify which one of the various types of contracts was most frequently awarded.

536,467
AD-A153 974/1/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Size Distribution, Fiscal Year 1980.
Annual rept.
1980, 15p
Availability: Microfiche copies only.

This report provides data on prime contract actions over $10,000 (500,000 for older years) awarded by the Department of Defense. For reporting purposes, contracts have been distributed by dollar value into 11 different size categories. The tables provide information on the number of total actions, their net value, and their percent distribution by size and according to a variety of categories, including awarding agency, type of contract involved, type of contract action taken, and competitive status. Table 1 presents data by individual size category (e.g., $10,000 to $24,000; $25,000 to $49,000), while Tables 2 through 5 present data in cumulative categories (e.g., $10,000 or more; $25,000 or more). This information assists DoD management in projecting the workload that will be required by various proposed projects. These data can also be used to identify trends in DoD procurement, e.g., to identify which one of the various types of contracts was most frequently awarded.

536,468
AD-A153 975/8/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Size Distribution, Fiscal Year 1981.
Annual rept.
Jan 82, 16p
Availability: Microfiche copies only.

This report provides data on prime contract actions over $10,000 (500,000 for older years) awarded by the Department of Defense. For reporting purposes, contracts have been distributed by dollar value into 11 different size categories. The tables provide information on the number of total actions, their net value, and their percent distribution by size and according to a variety of categories, including awarding agency, type of contract involved, type of contract action taken, and competitive status. Table 1 presents data by individual size category (e.g., $10,000 to $24,000; $25,000 to $49,000), while Tables 2 through 5 present data in cumulative categories (e.g., $10,000 or more; $25,000 or more). This information assists DoD management in projecting the workload that will be required by various proposed projects. These data can also be used to identify trends in DoD procurement, e.g., to identify which one of the various types of contracts was most frequently awarded.

536,469
AD-A153 976/6/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Size Distribution, Fiscal Year 1982.
Annual rept.
1982, 15p
Availability: Microfiche copies only.

This report provides data on prime contract actions over $10,000 (500,000 for older years) awarded by the Department of Defense. For reporting purposes, contracts have been distributed by dollar value into 11 different size categories. The tables provide information on the number of total actions, their net value, and their percent distribution by size and according to a variety of categories, including awarding agency, type of contract involved, type of contract action taken, and competitive status. Table 1 presents data by individual size category (e.g., $10,000 to $24,000; $25,000 to $49,000), while Tables 2 through 5 present data in cumulative categories (e.g., $10,000 or more; $25,000 or more). This information assists DoD management in projecting the workload that will be required by various proposed projects. These data can also be used to identify trends in DoD procurement, e.g., to identify which one of the various types of contracts was most frequently awarded.

536,470
AD-A153 993/1/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Fiscal Year 1977.
Semiannual rept.
27 Mar 79, 86p
Availability: Microfiche copies only.

This report presents a variety of current and historical data pertaining to Department of Defense (DoD) prime contract awards. Reports started as of 1958. Seven categories of data on DoD prime contracts are provided. Data are displayd by type of contractor, by procurement program, by method of procurement, and by type of contract pricing provision. Awards publicized to Small Business and awards for research, development, test, and evaluation (RDT/E) are discussed separately, as is the DoD Small Business subcontracting program. Beginning with FY 1983, the dollar threshold for reporting detailed information on procurement actions was raised from over $10,000 to over $25,000.

536,471
AD-A153 995/6/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Fiscal Year 1979.
Semiannual rept.
30 Apr 80, 95p
Availability: Microfiche copies only.

This report presents a variety of current and historical data pertaining to Department of Defense (DoD) prime contract awards. Reports started as of 1958. Seven categories of data on DoD prime contracts are provided. Data are displayd by type of contractor, by procurement program, by method of procurement, and by type of contract pricing provision. Awards publicized to Small Business and awards for research, development, test, and evaluation (RDT/E) are discussed separately, as is the DoD Small Business subcontracting program. Beginning with FY 1983, the dollar threshold for reporting detailed information on procurement actions was raised from over $10,000 to over $25,000.

536,472
AD-A153 996/4/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Fiscal Year 1980.
Semiannual rept.
12 Feb 81, 101p
Availability: Microfiche copies only.

This report presents a variety of current and historical data pertaining to Department of Defense (DoD) prime contract awards. Reports started as of 1958. Seven categories of data on DoD prime contracts are provided. Data are displayd by type of contractor, by procurement program, by method of procurement, and by type of contract pricing provision. Awards publicized to Small Business and awards for research, development, test, and evaluation (RDT/E) are discussed separately, as is the DoD Small Business subcontracting program. Beginning with FY 1983, the dollar threshold for reporting detailed information on procurement actions was raised from over $10,000 to over $25,000.

536,473
AD-A153 997/2/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Fiscal Year 1981.
Semiannual rept.
1981, 106p
Availability: Microfiche copies only.

This report presents a variety of current and historical data pertaining to Department of Defense (DoD) prime

contract awards. Reports started as of 1958. Seven categories of data on DoD prime contracts are provided. Data are displayd by type of contractor, by procurement program, by method of procurement, and by type of contract pricing provision. Awards publicized to Small Business and awards for research, development, test, and evaluation (RDT/E) are discussed separately, as is the DoD Small Business subcontracting program. Beginning with FY 1983, the dollar threshold for reporting detailed information on procurement actions was raised from over $10,000 to over $25,000.

536,474
AD-A153 998/0/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards, Fiscal Year 1982.
Semiannual rept.
1982, 74p
Availability: Microfiche copies only.

This report presents a variety of current and historical data pertaining to Department of Defense (DoD) prime contract awards. Reports started as of 1958. Seven categories of data on DoD prime contracts are provided. Data are displayd by type of contractor, by procurement program, by method of procurement, and by type of contract pricing provision. Awards publicized to Small Business and awards for research, development, test, and evaluation (RDT/E) are discussed separately, as is the DoD Small Business subcontracting program. Beginning with FY 1983, the dollar threshold for reporting detailed information on procurement actions was raised from over $10,000 to over $25,000.

536,475
AD-A154 001/2/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards in Labor Surplus Areas Fiscal Year 1978.
Annual rept. Oct 77-Sep 78.
31 Oct 79, 33p
Availability: Microfiche copies only.

This report provides detailed information on DoD prime contracts over $25,000 (for later years and $10,000 for years back to 1977) for performance in labor surplus areas, in areas of substantial or persistent unemployment. Reports list prime contract awards in labor surplus areas compared with total procurement, prime contract awards in labor surplus areas to U.S business firms, by type of set-aside preference, net value of prime contract awards in labor surplus areas; net value of prime contract awards in labor surplus areas for labor surplus area set-aside preference, and net value of prime contract awards in labor surplus areas for combined labor surplus/small business set-aside preference. Supporting data are presented by state, county, and city, according to the purchasing department making the awards.

536,476
AD-A154 002/0/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards in Labor Surplus Areas Fiscal Year 1979.
Annual rept. Oct 78-Sep 79.
10 Oct 80, 35p
Availability: Microfiche copies only.

This report provides detailed information on DoD prime contracts over $25,000 (for later years and $10,000 for years back to 1977) for performance in labor surplus areas, in areas of substantial or persistent unemployment. Reports list prime contract awards in labor surplus areas compared with total procurement, prime contract awards in labor surplus areas to U.S business firms, by type of set-aside preference, net value of prime contract awards in labor surplus areas; net value of prime contract awards in labor surplus areas for labor surplus area set-aside preference, and net value of prime contract awards in labor surplus areas for combined labor surplus/small business set-aside preference. Supporting data are presented by state, county, and city, according to the purchasing department making the awards.

536,477
AD-A154 003/8/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards in Labor Surplus Areas Fiscal Year 1980.
Annual rept. Oct 79-Sep 80.
24 Apr 81, 153p
Availability: Microfiche copies only.

This report provides detailed information on DoD prime contracts over $25,000 (for later years and $10,000 for years back to 1977) for performance in labor surplus areas, in areas of substantial or persistent unemployment. Reports list prime contract awards in labor surplus areas compared with total procurement, prime contract awards in labor surplus areas to U.S business firms, by type of set-aside preference, net value of prime contract awards in labor surplus areas; net value of prime contract awards in labor surplus areas for labor surplus area set-aside preference, and net value of prime contract awards in labor surplus areas for combined labor surplus/small business set-aside preference. Supporting data are presented by state, county, and city, according to the purchasing department making the awards.

536,478
AD-A154 004/6/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards in Labor Surplus Areas Fiscal Year 1981.
Annual rept. Oct 80-Sep 81.
Dec 81, 216p
Availability: Microfiche copies only.

This report provides detailed information on DoD prime contracts over $25,000 (for later years and $10,000 for years back to 1977) for performance in labor surplus areas, in areas of substantial or persistent unemployment. Reports list prime contract awards in labor surplus areas compared with total procurement, prime contract awards in labor surplus areas to U.S business firms, by type of set-aside preference, net value of prime contract awards in labor surplus areas; net value of prime contract awards in labor surplus areas for labor surplus area set-aside preference, and net value of prime contract awards in labor surplus areas for combined labor surplus/small business set-aside preference. Supporting data are presented by state, county, and city, according to the purchasing department making the awards.

536,479
AD-A154 005/3/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards in Labor Surplus Areas Fiscal Year 1982.
Annual rept. Oct 81-Sep 82.
1982, 250p
Availability: Microfiche copies only.

This report provides detailed information on DoD prime contracts over $25,000 (for later years and $10,000 for years back to 1977) for performance in labor surplus areas, in areas of substantial or persistent unemployment. Reports list prime contract awards in labor surplus areas compared with total procurement, prime contract awards in labor surplus areas to U.S business firms, by type of set-aside preference, net value of prime contract awards in labor surplus areas; net value of prime contract awards in labor surplus areas for labor surplus area set-aside preference, and net value of prime contract awards in labor surplus areas for combined labor surplus/small business set-aside preference. Supporting data are presented by state, county, and city, according to the purchasing department making the awards.

536,480
AD-A154 009/5/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards by Region and State, Fiscal Years 1977, 1978 and 1979.
Annual rept.
15 May 80, 83p
Availability: Microfiche copies only.

Prime contract awards by region and state is published annually by the Office of the Secretary of Defense, Washington Headquarters Service, Directorate for Information Operations and Reports (WHS/DIOR). This issue provides information on the geographical distribution of Department of Defense prime contract awards over $10,000 for Fiscal Years (FY) by the United States census region and state. This information is detailed in tables and figures showing: the net value and percent distribution of awards, by region and state, for FY; the net value and percent distribution of awards within the seven major hard goods programs, by region, for FY; the net value and percent distribution of awards in the 25 major procurement programs for each state for FY; and data on research, development, test, and evaluation (RDT/E) awards by region and state according to the type of contractor for FY.

536,481
AD-A154 010/3/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards by Region and State, Fiscal Years 1978, 1979 and 1980.
Annual rept.
1980, 83p
Availability: Microfiche copies only.

Prime contract awards by region and state is published annually by the Office of the Secretary of Defense, Washington Headquarters Service, Directorate for Information Operations and Reports (WHS/DIOR). This issue provides information on the geographical distribution of Department of Defense prime contract awards over $10,000 for Fiscal Years (FY) by the United States census region and state. This information is detailed in tables and figures showing: the net value and percent distribution of awards, by region and state, for FY; the net value and percent distribution of awards within the seven major hard goods programs, by region, for FY; the net value and percent distribution of awards in the 25 major procurement programs for each state for FY; and data on research, development, test, and evaluation (RDT/E) awards by region and state according to the type of contractor for FY.

536,482
AD-A154 011/1/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards by Region and State, Fiscal Years 1979, 1980 and 1981.
Annual rept.
Jan 82, 83p
Availability: Microfiche copies only.

Prime contract awards by region and state is published annually by the Office of the Secretary of Defense, Washington Headquarters Service, Directorate for Information Operations and Reports (WHS/DIOR). This issue provides information on the geographical distribution of Department of Defense prime contract awards over $10,000 for Fiscal Years (FY) by the United States census region and state. This information is detailed in tables and figures showing: the net value and percent distribution of awards, by region and state, for FY; the net value and percent distribution of awards within the seven major hard goods programs, by region, for FY; the net value and percent distribution of awards in the 25 major procurement programs for each state for FY; and data on research, development, test, and evaluation (RDT/E) awards by region and state according to the type of contractor for FY.

536,483
AD-A154 012/9/GAR MF A01
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Prime Contract Awards by Region and State, Fiscal Years 1980, 1981 and 1982.
Annual rept.
1982, 83p
Availability: Microfiche copies only.

Prime contract awards by region and state is published annually by the Office of the Secretary of Defense, Washington Headquarters Service, Directorate for Information Operations and Reports (WHS/DIOR). This issue provides information on the geographical distribution of Department of Defense prime contract awards over $10,000 for Fiscal Years (FY) by the United States census region and state. This information is detailed in tables and figures showing: the net value and percent distribution of awards, by region and state, for FY; the net value and percent distribution of awards within the seven major hard goods programs, by region, for FY; the net value and percent distribution of awards in the 25 major procurement programs for

each state for FY; and data on research, development, test, and evaluation (RDT/E) awards by region and state according to the type of contractor for FY.

536,484
AD-A154 015/2/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Foreign Military Sales: MPCF Alpha FY-86.
Annual rept.
10 Jun 77, 35p
Availability: Microfiche copies only.

This annually published DIOR document gives contractor name, city name, state or county name, codes for lack of the above, purchasing office, report number activity, if it is a minority business firm, multi-year, procurement, labor surplus area, FSC or service code, kind of procurement action, type of business concern, cost accounting standards, award month, and estimated completion date. Contracts cover military equipment, and parts for weapon systems.

536,485
AD-A154 027/7/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Foreign Military Sales FY-77.
Annual rept.
18 Aug 81, 252p
Availability: Microfiche copies only.

This annually published DIOR document gives contractor name, city name, state or county name, codes for lack of the above, purchasing office, report number activity, if it is a minority business firm, multi-year, procurement, labor surplus area, FSC or service code, kind of procurement action, type of business concern, cost accounting standards, award month, and estimated completion date. Contracts cover military equipment, and parts for weapon systems.

536,486
AD-A154 029/3/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Foreign Military Sales FY-79.
Annual rept. Oct 78-Sep 79.
30 Sep 79, 301p
Availability: Microfiche copies only.

This annually published DIOR document gives contractor name, city name, state or county name, codes for lack of the above, purchasing office, report number activity, if it is a minority business firm, multi-year, procurement, labor surplus area, FSC or service code, kind of procurement action, type of business concern, cost accounting standards, award month, and estimated completion date. Contracts cover military equipment, and parts for weapon systems.

536,487
AD-A154 030/1/GAR MF **A01**
Washington Headquarters Services (DoD), DC. Directorate for Information Operations and Reports.
Department of Defense Foreign Military Sales FY-81.
Annual rept. Oct 80-Sep 81.
30 Sep 81, 355p
Availability: Microfiche copies only.

This annually published DIOR document gives contractor name, city name, state or county name, codes for lack of the above, purchasing office, report number activity, if it is a minority business firm, multi-year, procurement, labor surplus area, FSC or service code, kind of procurement action, type of business concern, cost accounting standards, award month, and estimated completion date. Contracts cover military equipment, and parts for weapon systems.

536,488
DE85009656/GAR PC **A05**/MF **A01**
Argonne National Lab., IL.
Transportation During Periods of Mobilization: A Historical Review. Final Report.
D. P. Middendorf, and L. R. Johnson. Jul 84, 99p
ANL/EES-TM-274
Contract W-31-109-ENG-38

The effects of the US transportation system of military preparations for war are compounded by the concurrent transportation requirements of economic mobilization to support a war effort. Several studies of military logistics have concluded that the transportation system may be the limiting factor in determining whether there is a successful operation. The responsiveness of the US transportation system during recent military conflicts is reviewed, beginning with the Spanish-American War and continuing through the Korean War. The nature and scope of each war is characterized, and the associated mobilization is described. Technological developments and regulatory changes in the transportation system since World War II are also reviewed in terms of their implications for the response capability of the nation. The dominant theme that emerges from this study is the overriding need for close coordination between modes and appropriate setting of priorities for shipments. The lack of an efficient system ultimately results in severe congestion at ports and terminals. The critical importance of the merchant marine fleet in overseas conflicts during the previous wars is also identified. (ERA citation 10:023358)

536,489
PB85-172732/GAR CP **T02**
Defense Logistics Services Center, Battle Creek, MI.
NATO Supply Code for Manufacturers Excluding U.S. and Canada, Name Sequence.
Data file,
J. M. McClenahan, and M. Arroyo. Apr 85, mag tape
DSA-FC-H4-3-SEC-B, DSA/DF-85/011
Supersedes PB84-158294.
Source tape is in the EBCDIC character set. This restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

This magnetic tape contains Organizational Entities (O.E.s) that maintain design control and/or is a source of supply for items procured and cataloged by agencies of the Federal Government, the North Atlantic Treaty Organization (NATO) member nations and other participating friendly governments, such as Australia. These coded Organizational Entities are in alphabetical sequence by name and record such information as the geographical location, former name and/or location, if applicable, assigned O.E. code, status of coded O.E.; i.e., active, obsolete, canceled with or without a replacement. In some instances, the replacement O.E. will be located in the United States, its possessions, or Canada. In this instance, refer to the Federal Supply Code for Manufacturers, United States and Canada (H 4-1/H 4-2) for the applicable replacement O.E. code data.

536,490
PB85-172740/GAR CP **T02**
Defense Logistics Services Center, Battle Creek, MI.
NATO Supply Code for Manufacturers Excluding U.S. and Canada, Code Sequence.
Data file,
J. M. McClenahan, and M. Arroyo. Apr 85, mag tape
DSA-FC-H4-3-SEC-D, DSA/DF-85/010
Supersedes PB84-158286.
Source tape is in the EBCDIC character set. This restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

This magnetic tape contains Organizational Entities (O.E.s) that maintain design control and/or is a source of supply for items procured and cataloged by agencies of the Federal Government, the North Atlantic Treaty Organization (NATO) member nations and other participating friendly governments, such as Australia. These coded Organizational Entities are in O.E. Code sequence and record such information as the name of the coded O.E., its geographical location, former name and/or location, if applicable, assigned O.E. code, status of coded O.E.; i.e., active, obsolete, canceled with or without a replacement. In some instances, the replacement O.E. will be located in the United States, its possessions, or Canada. In this instance, refer to the Federal Supply Code for Manufacturers, United States and Canada (H 4-1/H 4-2) for the applicable replacement O.E. Code data.

536,491
PB85-910900/GAR Standing Order
Defense Logistics Services Center, Battle Creek, MI.
Federal Supply Code for Manufacturers, U.S. and Canada, Name Sequence.
Data files.
1985, mag tapes
Supersedes PB84-910900.
Source tape is in the EBCDIC character set. This restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Available on Standing Order, Deposit Account required. North American Continent price $1200.00/year, individual issue $240.00; all others write for quote. Updated 6 times a year.

This magnetic tape contains Organizational Entities (O.E.s) that are manufacturers or maintain design control of items of supply procured and cataloged by agencies of the Federal Government. These coded Organizational Entities are in alphabetical sequence by name and record such information as the geographical location, former name and/or location, if applicable, assigned O.E. Code, status of coded O.E.; i.e., active, obsolete, canceled with or without replacement. In some instances, the replacement O.E. will be located in a North Atlantic Treaty Organization (NATO) member nation, or other participating friendly foreign country, such as Australia. In this instance, refer to the NATO Supply Code for Manufacturers, Excluding United States and Canada (H4-3) for the applicable replacement O.E. Code data.

536,492
PB85-911000/GAR Standing Order
Defense Logistics Services Center, Battle Creek, MI.
Federal Supply Code for Manufacturers, U.S. and Canada, Code Sequence.
Data files.
1985, mag tapes
Supersedes PB84-911000.
Source tape is in the EBCDIC character set. This restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Available on Standing Order, Deposit Account required. North American Continent price $1200.00/year, individual issue $240.00; all others write for quote. Updated 6 times a year.

This magnetic tape contains Organizational Entities (O.E.s) that are manufacturers or maintain design control of items of supply procured and cataloged by agencies of the Federal Government. These coded Organizational Entities are in O.E. Code sequence and record such information as the name of the coded O.E., its geographical location, former name and/or location, if applicable, assigned O.E. Code, status of coded O.E.; i.e., active, obsolete, canceled with or without a replacement. In some instances, the replacement O.E. will be located in a North Atlantic Treaty Organization (NATO) member nation, or other participating friendly foreign country, such as Australia. In this instance, refer to the NATO Supply Code for Manufacturers. Excluding United States and Canada (H 4-3) for the applicable replacement O.E. Code data.

15F. Nuclear Warfare

536,493
DE85780529/GAR PC **A07**/MF **A01**
Technische Hogeschool Twente, Enschede (Netherlands).
Electromagnetic Pulse. An Underestimated Aspect of Nuclear Warfare.
J. J. Hutter. 1983, 130p THT-BC-8301
In Dutch.
U.S. Sales Only.

In this report, existing knowledge about the electromagnetic pulse has been collected from stray publications in technical and scientific journals, governmental reports and newspapers. In the first part, some technical aspects are dealt with. Physics and civil consequences of low, middle, high and exoatmospheric nuclear explosions are discussed. In the second part, the author discusses the consequences to nuclear warfare, as well as some political aspects of the Dutch government's opinion. (Atomindex citation 15:062256)

15G. Operations, Strategy, and Tactics

536,494
AD-A153 614/3/GAR PC **A03/MF A01**
Center for Naval Analyses, Alexandria, VA. Naval Studies Group.
War for the Falklands: A Chronology.
Professional paper,
K. G. Weiss. Aug 82, 32p Rept no. CNA-PP-420
Contract N00014-83-C-0725

Listed are the significant events which occurred each day, from March 19 to June 15, 1982, in the British-Argentine war for possession of the Falkland Islands.

536,495
AD-A153 741/4/GAR PC **A03/MF A01**
Center for Naval Analyses, Alexandria, VA. Policy and Resources Research Dept.
Mare Mosso: The Mediterranean Theater.
Professional paper,
N. B. Dismukes, and K. G. Weiss. Nov 84, 27p Rept no. CNA-PP-423
Contract N00014-83-C-0725

Frequent reassessment of the strategic situation in a theater is always useful and for the naval planner always has the same point: does the current and planned U.S. naval posture in the theater make sense. When it comes to the Mediterranean many have argued that the goal of maintaining two carriers continuously deployed with Sixth Fleet does not make sense. The authors are inclined to agree and offer the following assessment of the Mediterranean theater to support this judgment. We will not argue the details of what a remodeled Sixth Fleet ought to be; our research does permits use to conclude, however, if it is the nation's judgment that change is desirable, the situation is ripe for implementing a change at quite reasonable political costs within the Mediterranean theater itself. Contents: Background; Origins of Current Situation; Peacetime Deployments; Soviet Naval Activities; U.S. Naval Activities; Wartime Strategy and Operations: Soviet Options, Western Options, Prospects for the Future.

17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

17A. Acoustic Detection

536,496
AD-A153 794/3/GAR PC **A02/MF A01**
Naval Underwater Systems Center, New London, CT. New London Lab.
Two-Dimensional Arrays with Nonlinear Elements,
R. F. Dwyer. 29 Mar 85, 16p Rept no. NUSC-REPRINT-7361
Pub. in Proceedings of the International Conference on Acoustics, Speech, and Signal Processing, 26-29 Mar 85.

The use of sensors configured into various geometrical shapes called arrays are of fundamental importance in extracting temporal, spatial, frequency, and probability distribution information in underwater acoustic and other applications. This paper explores the effectiveness of a two-dimensional or planar array in extracting spatial and frequency information. The method utilizes a receiver which converts digitized data at the output of each element, which may be nonlinear, into its frequency components using a discrete-Fourier transform. The frequency components are than weighted and summed all over spatial elements. The objective of the optimum receiver is to chose the weights so that a performance measure is maximized. After a discussion a performance measure is introduced and the formulation for the optimum weights given. To combat non-Gaussian interference an ideal nonlinearity is introduced, Several examples are given comparing the performance of a receiver with and without an ideal nonlinearity in an impulsive or non-Gaussian noise environment. (Author)

536,497
AD-A153 922/0/GAR PC **A04/MF A01**
Mandex, Inc., Rockville, MD. Underwater Systems Group.
Target Motion Analysis Algorithms for Rapid Localization Methods.
Final rept.,
J. B. McQuitty. 27 Feb 85, 62p
Contract N60921-84-C-0098

Several least-squares linear regression Target Motion Analysis (TMA) algorithms were derived for use when target range as well as bearing measurements are available from Rapid Localization underwater passive acoustic sensor systems, including the Wide Aperture Array for attack submarines. Simulation error analyses, for a number of typical target encounter geometries, were conducted for each of the range-bearing TMA algorithms and for the bearings-only TMA algorithm, which must be used whenever range data is unavailable. The results showed that one particular algorithm, (K sub OPT (R - B) + (B - O)), was significantly more accurate than any of the others against non-maneuvering targets and another algorithm, (2, 2 x 2; R - B), performed best against maneuvering targets. Both of these TMA algorithms require range as well as bearing measurement inputs. The optimum weighting factor, K sub OPT, and weighting coefficient, a, which minimize the TMA errors were also derived. Least-squares TMA algorithms were derived for the special case that the target's down-range velocity component is either known or assumed to be known. One of these is the least-squares linear regression algorithm for the Ekelund ranging method.

17B. Communication

536,498
AD-A153 442/9/GAR PC **A03/MF A01**
Dynamics Research Corp., Wilmington, MA.
Defense Data Network Support Concept Analysis.
Final technical briefing,
L. S. Cohen, and W. J. Miller. Jan 85, 26p
Contract F19628-84-D-0016
See also Rept. no. E-9597U, AD-A153 214.

This final technical briefing presents an outline form of the data in the final report with the same name, dated 26 December 1984.

536,499
AD-A153 584/8/GAR PC **A06/MF A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Alternatives for Extending the European Distribution System's Log C3I (Command, Control, Communications, and Intelligence) Subsystem to the Collocated Operating Base Level.
Master's thesis,
K. F. Donovan. Dec 84, 152p Rept no. AFIT/GLM/LSM/84D-1

This thesis analyzed the communications and Automated Data Processing Equipment (ADPE) options available to extend the original configuration of the new European Distribution System's (EDS) Command, Control, Communications, and Intelligence (C3I) subsystem from Europe's Main Operating Base level to the Collocated Operating Base level. The EDS is a space parts distribution system based on three major sub-systems: dedicated aircraft; in-theater warehouses and a automated C3I system. The basic approach taken to conduct this analysis was to first determine acceptable configurations for the extended system. With these in mind, C3 systems that are fielded or soon to be implemented in the European theater were examined for possible integration into EDS. Additionally, emerging and other possible C3 technologies were identified for further analysis. These preceding steps provided a list of C3 alternatives for evaluation under a technique known as the Brown-Gibson approach which rank-orders the options using both subjective and objective (cost) criteria.

536,500
AD-A153 606/9/GAR PC **A02/MF A01**
University of Southern California, Marina del Rey. Information Sciences Inst.
Internetwork Applications Using the DARPA (Defense Advanced Research Projects Agency) Protocol Suite.
Research rept.,
J. Postel. Apr 85, 17p Rept no. ISI/RS-85-151
Contract MDA903-81-C-0335
Pub. in INFOCOM: Computers and Communications Integration: The Confluence at Mid-Decade, 1985.

The DARPA research community has experimented with a wide range of applications based on the Internet system and protocol suite. This reprint describes many of these applications, especially the ones that are used most. Among the applications discussed are the computer or electronic mail service, two file transfer services, and the remote terminal access service. In addition, a number of transaction-based simple information services are described. The DARPA Internet system has a layered architecture, and within this architecture a suite of protocols has been developed. This paper focuses on the applications in this suite of protocols. Nearly all of the applications are implemented on one or the other of the two service protocols: the Transmission Control Protocol (TCP) or the User Datagram Protocol. The TCP provides a reliable end-to-end data stream connection for process-to-process communication. The UDP provides process-level access to a simple datagram service with no reliability guarantees. The paper discusses the applications that are widely implemented in the Internet, including computer mail, file transfer, remote terminal access, name lookup service, and time lookup service. In addition, some experimental applications are discussed, including Stream Protocol and Network Voice Protocol. It should be noted that the DARPA protocol suite is continuously evolving, and that new protocols are developed every year.

536,501
AD-A153 624/2/GAR PC **A07/MF A01**
SRI International, Menlo Park, CA. Network Information Center.
Internet Protocol Implementation Guide.
Aug 82, 148p
Contract DCA200-83-C-0025

This document provides summary and tutorial information on research and development carried out by the DoD on the interconnection and use of packet communication networks. Topics covered include TCP-IP, fault isolation and gateway connections between dissimilar networks. Guidelines are provided for implementing the Internetwork protocols, along with background papers on the Internetwork protocols and protocols in general. (Author)

536,502
AD-A153 625/9/GAR PC **A06/MF A01**
SRI International, Menlo Park, CA. Network Information Center.
Internet Mail Protocols.
Nov 82, 125p
Contract DCA200-83-C-0025

This document contains RFC 821 (Simple Mail Transfer Protocol-SMTP) and RFC 822 (Standard for the Format of ARPA Internet Text Messages), which are the basic protocols that support all network mail. The SMTP is independent of the particular transmission subsystem, and requires only a reliable ordered data stream channel. Appendices describe the use of SMTP with various transport services, The second part of this document describes syntax requirements and options for computer messages sent by electronic mail. These RFCs update information contained in the Internet Protocol Transition Workbook.

536,503
AD-A153 721/6/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.

LPC (Linear Predictive Coding) Synthesis with Simplified Spectrum Flattening of the Excitation Function.
Journal article,
B. Gold, and J. Tierney. Oct 82, 4p JA-5329, ESD-TR-85-072
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in Jnl. of Acoustical Society of America, v72 n4 p1306-1309 Oct 82.

Implementation of spectrum flattening of the excitation signal of an LPC (Linear Predictive Coding) vocoder is described. This modification yielded a small increase of intelligibility and a noticeable change in the quality of the perceived LPC speech.

536,504
AD-A153 764/6/GAR PC **A04**/MF **A01**
Army Engineer Div., Huntsville, AL.
Reliability Report for Communication Networks.
Jul 84, 62p Rept no. HNDSP-84-096-ED-ME

The individual systems to be studied are a dual loop with redundant front end modems versus a radial system with eight points of connection which are shown in figures sixteen and seventeen. The ring type system as described is actually a bus configuration arranged in a loop, since each node has access to two lines. The communication lines are common to all. The radial system is actually a parallel system, since each node has its own front end modem. Each may be reconfigured.

536,505
AD-A153 915/4/GAR PC **A02**/MF **A01**
University of Southern California, Marina del Rey. Information Sciences Inst.
DARPA (Defense Advanced Research Projects Agency) Internet Protocol Suite.
Research rept.,
B. Leiner, R. Cole, J. Postel, and D. Mills. Apr 85, 20p Rept no. ISI/RS-85-153
Contract MDA903-81-C-0335
Pub. in INFCOM '85, Computers and Communications Integration: The Confluence at Mid-decade, held in Washington, DC, March 1985.

The military requirement for computer communications between heterogeneous computers on heterogenous networks has driven the development of a standard suite of protocols to permit such communications to take place in a robust and flexible manner. These protocols support an architecture consisting of multiple packet switched networks interconnected by gateways. The DARPA experimental internet system consists of satellite, terrestrial, radio and local networks all interconnected through a system of gateways and a set of common protocols. In this reprint, the suite of protocols supporting this internet system is described.

536,506
AD-A153 919/6/GAR PC **A03**/MF **A01**
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
High Performance Asynchronous Limited Sensing Algorithms for CSMA and CSMA-CD Channels.
Technical rept.,
M. Georgiopoulos, L. Merakos, and P. Papantoni-Kazakos. Mar 85, 44p UCT/DEECS/TR-85-2, AFOSR-TR-85-0398
Grant AFOSR-83-0229

We consider the random multiple access of a collision-type, packet-switched channel, for the Poisson user model in a local area network environment, where 'carrier sensing' techniques are possible due to small propagation delays. We propose and analyze asynchronous (unslotted) random access algorithms that belong to a recently emerged class of random-access algorithms, called 'limited channel sensing' algorithms. Utilizing the regenerative character of the stochastic processes that are associated with the random access system, we derive lower bounds on the maximum stable throughput, and tight upper and lower bounds on the induced mean packet delay. The proposed algorithms are inherently stable, they combine good performance with modest channel sensing requirements, and they outperform their synchronous counterparts in some Ethernet and mobile radio environments.

536,507
AD-A153 938/6/GAR PC **A04**/MF **A01**
Marine Corps Development and Education Command, Quantico, VA. Development Center.
Operational Guidelines for Urban Communications.
Final rept.,
W. L. Maupin. 14 Oct 83, 58p

Contents: Characteristics of Urban RF Environment: Propagation Phenomena, Multipath and Direct Path Loss, Digital Multipath Considerations, Antenna Efficiency, Noise Interference, Frequency; Current Communications Systems in Urban Environments: HF Systems, VHF Systems, USF Systems, SHF Systems; Operator Techniques for Urban Operations: Frequency Selection, Equipment Placement, Other Techniques, Interference, Equipment Condition; Improved Deployment: Frequency Usage/Management, Antenna Improvements, Relays and Remote Transmission; Future Techniques/Technologies: Packet Radio, Millimeter Wave Radio, Ultra-Violet Radio, Cellular Radio.

536,508
AD-A153 966/7/GAR PC **A05**/MF **A01**
Marine Corps Development and Education Command, Quantico, VA.
Communication Force Structure Study.
Final rept.,
C. C. Bryant. 31 Mar 85, 83p

The Marine Corps is inadequately prepared to support present doctrine. Existing deficiencies severly handicap Marine communicators in their attempt to provide tactical communications support under combat conditions, The present structure of the communications battalion is organized to support a Marine Amphibious (MAF) Headquarters and provide communication support to other units of the MAF requiring assistance. This study identified the structure, mission statements, and major items of equipment required to support the headquarters of multiple Marine Air Ground Task Force (MAGTF) deployments. The scope of this study includes MAGTF headquarters and their links with senior and subordinate commands.

536,509
AD-A154 031/9/GAR PC **A22**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Propagation Influences on Digital Transmission Systems: Problems and Solutions Held at Athens, Greece on 4-8 June 1984.
Conference proceedings,
J. H. Blythe. 8 Jun 84, 518p Rept no. AGARD-CP-363
Text in English and French.

Contents: Propagation Constraints to Reliable Digital Communications, Recent Progress in Propagation Measurements and Propagation Models, Recent Progress in Propagation Measurements and Propagation Models, Channel Simulation, Signal Processing Technology, and Signalling and Sounding Schemes for Reliable Digital Communications.

536,510
ED-253 200 Not available NTIS
Aarhus Graduate School of Economics, Business Administration and Modern Languages (Denmark).
Commercial Transnational and Neighbour Country TV in Europe. Economic Consequences and Consumer Perspectives. Case: Sky Channel and West German TV from a Danish Perspective. Skriftserie E, nr. 14.
P. Sepstrup. 1985, 119p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The commercials on the Sky Channel, the first pan-European satellite television channel, and on the West German Channel 2 (or ZDF) are analyzed in this report. The study summarizes an investigation of the economic consequences of transborder television advertising in Europe and the consequences for consumers if television advertising grows or is introduced into a country where, previously, no television advertising has been premitted. Included are: a description of the Sky Channel and the viewing of West German television commercials in Denmark, a documentation and description of the kind and amount of advertising on Sky Channel for three months and on ZDF for one week in 1984, and an analysis of the information content of the commercials. Additional details are provided on the history, audience, and programming of Sky Channel; the basic structure of West German television and the fundamental rules for West German television advertising; the study methodology; and the concern that transborder television advertising may cause a competitive disadvantage for local or national brands that cannot afford satellite or neighbor-country advertising. The coding scheme used for the content analysis is included. (LMM).

536,511
PB85-182137/GAR PC **E04**/MF **E04**
University Coll., London (England). Dept. of Computer Science.
UCL (University College, London) UMC-Z80 Unix Front-End.
Technical rept.,
G. Knight. Jul 84, 29p INDRA-TR-98

Since 1979 University College London has been developing software to interface their Unix systems to Cambridge Ring local area networks. This article describes the design and implementation of a z80 based front end for Unibus based machines.

536,512
PB85-182145/GAR PC **E05**/MF **E05**
University Coll., London (England). Dept. of Computer Science.
Final Report on Network Monitoring Management and Control in Project Universe.
Technical rept.,
S. Wilbur, B. Bacarisse, G. Knight, T. M. Liew, and Z. Ma. Apr 84, 56p INDRA-TR-101

The magnitude of a network such as the Universe one brings its own problems. Little was known about traffic levels, reliability of components, or about the problems in managing the essential databases of the network, such as routing and name tables. Consequently, the network monitoring experiment reported here was set up. Its scope was to try to gather information about data flows and reliability and to provide an embryo network control center. Thus, aspects of network database management and life cycle support for network software are also included.

536,513
PB85-182152/GAR PC **E12**/MF **E12**
University Coll., London (England). Dept. of Computer Science.
Organization of Multi-Type Documents and Their Transmission over Computer Networks.
Technical rept.,
T. Chang. May 83, 263p INDRA-TR-86

In this thesis, multi-type documents are used as a model to consider the problems concerned with integration of diverse data types, which enhances the quality of human communication. The ways are discussed in which communication systems, especially computer systems and computer networks, deal with data of different types and their integration. Two major categories of techniques are introduced whereby multi-type documents can be organized in a computer system: these are extension of a single data type and multi-type data structure. The functions, architecture, and operations are described in detail.

536,514
PB85-182517/GAR PC **E13**/MF **E13**
University Coll., London (England). Dept. of Computer Science.
Itegrated Network Management.
Technical rept.,
Z. Ma. 1983, 280p INDRA-TR-93

Network management includes three independent and closely related subjects -- network monitoring, control and administration. Network monitoring activities can be classified into five groups -- status, configuration, performance, event and fault monitoring. A probe is one of the most useful tools for status monitoring. Both the low level and the high level probe mechanisms are discussed. The design and implementation of an independent configuration monitoring system are presented. Network measurements for performance monitoring are introduced. The design and implementation of a fault monitoring device are given. Some control mechanisms are suggested. The implementation of a simplified intelligent trouble-shooting procedure, a down-line loading facility, a log information management system are described. The relationship and interactions between network monitoring, network control, and network administration are best illustrated in the prototype integrated network management system -- the UCL experimental Service Administrator. To overcome the inherent vulnerability of centralized manag-

ing systems, a distributed network management system is examined.

536,515
PB85-184950/GAR PC E05/MF E01
Toshiba Corp., Tokyo (Japan).
Toshiba Review, Vol. 40, No. 2, 1985.
c1985, 91p
Text in Japanese with English abstracts. See also PB85-184968 through PB85-184984, and PB85-162238.Color illustrations reproduced in black and white.

Special issue on Digitization of Audio-Video Products with special features on: Digital TV, PCM sound demodulation device for direct broadcasting satellite; Videotex decoder; Compact disc player, XR-V11W; Digital Cable Audio System, PCM audio IC processor for 8-mm VCR; High-Speed 8-Bit analog-to-digital converter, TD6701P for Video Signal processing; High-speed 10-bit digital-to-analog converter; Advanced high-speed bipolar logic IC; High-speed bipolar transistor compatible with High-speed CMOS FET Technology and general features on other equipment.

536,516
PB85-184968/GAR
(Order as PB85-184950/GAR, PC E05/MF E01)
Toshiba Corp., Tokyo (Japan).
PCM Sound Demodulation Device for Direct Broadcasting Satellite.
Y. Kasagi, K. Ohno, K. Motoe, and M. Yamanaka.
c1985, 4p
Text in Japanese.
Included in Toshiba Review, v40 n2 p89-92 1985.

Toshiba, participating in the system investigation and experiments to establish sound format for the direct broadcasting satellite from the beginning of the project, first developed and is now manufacturing the devices for the system mainly based on gate array. Success has been gained in developing the device kits based on custom ICs. These systems, incorporate the company's original error reduction and correction method both in QPSK and PCM IC's. In addition new features such as independent data service and descrambler function availability, have been added in prospect of future extension of this sound format to render service to direct broadcasting and CATV.

536,517
PB85-185357/GAR PC A04/MF A01
National Telecommunications and Information Administration, Annapolis, MD.
Necessary Bandwidth and Spectral Properties of Digital Modulation.
Technical rept.,
D. J. Cohen. Feb 85, 62p NTIA-84/168

The National Telecommunications and Information Administration (NTIA) and the Interdepartment Radio Advisory Committee (IRAC) require, for their management of the spectrum, technical guidance concerning the necessary bandwidth and spectral characteristics of digital modulation. The necessary bandwidth is the minimum emission bandwidth required for an acceptable quality of service. The NTIA Manual includes all guidance and criteria relating to necessary bandwidth in Annex J entitled 'Determination of Necessary Bandwidth.' In this report, the concept of necessary bandwidth is applied to digital modulation. The necessary bandwidths for several digital modulations are considered in detail. These are phase shift keying (PSK), minimum shift keying (MSK), and frequency shift keying (FSK). The techniques used to determine the necessary bandwidths are general and could be extended to other digital modulations. This report shows that for digital modulation systems, the necessary bandwidth, signal power, and bit error rate are all interrelated and tradeoffs among these factors are possible.

536,518
PB85-189363 Not available NTIS
National Bureau of Standards (NEL), Gaithersburg, MD. Law Enforcement Standards Lab.
Telephone Dialers with Taped Voice Messages.
Final rept.
Oct 84, 18p
Sponsored by National Inst. of Justice, Washington, DC.
Pub. in NIJ (National Inst. of Justice) Standard-0322.00, 18p Oct 84.

The standard establishes performance requirements and test methods for evaluating dialers that dial one or more specified telephone numbers and transmit one or more taped voice messages in response to an actuation. These devices transmit an alarm signal (the voice message(s)) through the ordinary switched telephone network to a telephone answering service or private phone. Emphasis in this standard is on characteristics affecting the ability of the devices to perform their tasks reliably and on factors that affect false alarm susceptibility.

536,519
PB85-189371 Not available NTIS
National Bureau of Standards (NEL), Gaithersburg, MD. Law Enforcement Standards Lab.
Telephone Dialers with Digitally Coded Messages.
Final rept.
Oct 84, 18p
Sponsored by National Inst. of Justice, Washington, DC.
Pub. in NIJ (National Inst. of Justice) Standard-0323.00, 18p Oct 84.

The standard establishes performance requirements and test methods for digital dialers. These dialers are intended to dial one or more preprogrammed telephone numbers and to transmit digitally coded messages in response to an actuation. These alarm messages are transmitted to special digital signal receivers via the ordinary switched telephone network. Emphasis in this standard is on characteristics that influence the ability of the dialer to perform its intended function reliably and some factors that affect false alarm susceptibility.

536,520
PB85-189934/GAR PC A04/MF A01
National Telecommunications and Information Administration, Washington, DC.
Summary of State Telephone Regulatory Data.
R. Entman, and T. Monroe. Mar 85, 58p NTIA-85-172

The report contains information on the most recent general rate cases of Bell Operating Companies (BOCs) in the continental U.S., as well as the major independent companies serving Alaska and Hawaii. It is a followup to NTIA's initial summary of August, 1984, which examined information on rate cases of BOCs in 20 selected states. As in the first report, data were collected on: (1) the total size of the request and award; (2) access charges; (3) rates of return; and (4) local service rates for residential and business customers. Data were also collected for a new category: installation charges. Information in this report is current as of March 15, 1985.

536,521
PB85-192342/GAR PC$26.00
International Telecommunication Union, Geneva (Switzerland). International Telegraph and Telephone Consultative Committee.
CCITT Plenary Assembly (8th), Malaga-Torremolinos (Spain), 8-19 October 1984. Volume 2, Fascicle 2.2. International Telephone Service Operation. Recommendations E.100-E.323.
1985, 269p ISBN-92-61-02001-1
Supersedes PB82-187535. See also PB85-192359.
North American Continent sales only. All others Deputy Secretary-General, International Telecommunication Union, Place des Nations, CH 1211, Geneva 20, Switzerland.

Contents: General provisions concerning administrations; General provisions concerning users; Operation of international telephone services; Numbering plan of the international telephone service; International routing plan; Tones for use in national signalling systems; Maritime mobile service; Charging (determination of collection charges) in the international telephone service; Procedures for remuneration of administrations for facilities made available; Measuring and recording call durations for accounting purposes; Establishment and exchange of international accounts; and Phototelegraphy.

536,522
PB85-192359/GAR PC$21.00
International Telecommunication Union, Geneva (Switzerland). International Telegraph and Telephone Consultative Committee.
CCITT Plenary Assembly (8th), Malaga-Torremolinos (Spain), 8-19 October 1984. Volume 2, Fascicle 2.3. International Telephone Service Network Management, Traffic Engineering. Recommendations E.401-E.600.
1985, 194p ISBN-92-61-02011-9
Supersedes PB82-187543. See also PB85-192342.
North American Continent sales only. All others Deputy Secretary-General, International Telecommunication Union, Place des Nations, CH 1211, Geneva 20, Switzerland.

Contents: International service statistics; International network management; Checking the quality of the international telephone service; Measurement and recording of traffic; Forecasting of traffic; Determination of the number of circuits in manual operation; Determination of the number of circuits in automatic and semi-automatic operation; Grade of service; and Terms and definitions of teletraffic engineering.

536,523
PB85-192615/GAR PC$23.00
International Telecommunication Union, Geneva (Switzerland). International Telegraph and Telephone Consultative Committee.
CCITT Plenary Assembly (8th), Malaga-Torremolinos (Spain), 8-19 October 1984. Volume 7, Fascicle 7.1. Telegraph Transmission. Recommendations of the R Series. Telegraph Services Terminal Equipment. Recommendations of the S Series.
1985, 246p ISBN-92-61-02271-5
See also PB85-192359.
North American Continent sales only. All others Deputy Secretary-General, International Telecommunication Union, Place des Nations, CH 1211, Geneva 20, Switzerland.

Contents: Telegraph distortion; Voice-frequency telegraphy; Special cases of alternating current telegraphy; Transmission quality; Correction of signals; Telegraph maintenance; Time division multiplexing; Transmission quality above 50 bauds; and Alphabetical telegraph--Start-stop terminals.

536,524
PB85-192623/GAR PC$22.00
International Telecommunication Union, Geneva (Switzerland). International Telegraph and Telephone Consultative Committee.
CCITT Plenary Assembly (8th), Malaga-Torremolinos (Spain), 8-19 October 1984. Volume 7, Fascicle 7.2. Telegraph Switching. Recommendations of the U Series.
1985, 232p ISBN-92-61-02281-2
See also PB85-192615.
North American Continent sales only. All others Deputy Secretary-General, International Telecommunication Union, Place des Nations, CH 1211, Geneva 20, Switzerland.

Contents: General; Specific signalling schemes and interworking between signalling systems; Signalling over radio and multiplexed channels; Gentex signalling; Particular signalling facilities; Radiotelex interworking; Interworking between new information services and Telex; and Telex store and forward.

536,525
PB85-192714/GAR PC$16.00
International Telecommunication Union, Geneva (Switzerland). International Telegraph and Telephone Consultative Committee.
CCITT Plenary Assembly (8th), Malaga-Torremolinos (Spain), 8-19 October 1984. Volume 9. Protection Against Interference. Recommendations of the K Series. Construction, Installation and Protection of Cables and Other Elements of Outside Plant. Recommendations of the L Series.
1985, 119p ISBN-92-61-02371-1
Supersedes PB82-187782. See also PB85-192623.
North American Continent sales only. All others Deputy Secretary-General, International Telecommunication Union, Place des Nations, CH 1211, Geneva 20, Switzerland.

Contents: Protection of telecommunication lines against harmful effects from electricity lines; Protection against corrosion; Impregnation of wooden poles; Armouring of cables; Aluminium cable sheaths; Cable sheaths made of metals other than lead or aluminium; Methods of keeping cables under gas pressure; Application of joint cathodic protection; and Corrosion caused by alternating current.

536,526
PB85-861219/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Data and Voice Packets in Communication Systems. 1970-May 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-May 85.
Jun 85, 81p

This bibliography contains citations of selected patents concerning packet transmitting, switching, and receiving techniques in data and voice communications. Data and speech packet transmitting and switching devices and methods, logic design, and data flow control systems are discussed. Packet switched broadcast and telephone systems are reviewed. (Contains 72 citations fully indexed and including a title list.)

536,527
PB85-861706/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Spread Spectrum Transmission. 1973-June 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1973-Jun 85.
Jun 85, 291p
Supersedes PB84-867274. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning technology and applications for spread spectrum transmission. Multiple access, phase shift keying, frequency hopping, and acquisition techniques are discussed. Adaptive algorithms and devices for inference rejection and system performance evaluation based on noise and error analysis are considered. Applications in communication systems are presented. (This updated bibliography contains 352 citations, 43 of which are new entries to the previous edition.)

536,528
PB85-861797/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Cable Television. 1970-June 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-Jun 85.
Jun 85, 96p

This bibliography contains citations of selected patents concerning cable television (CATV) transmission, converter control, substitution, distribution and faulty detection systems. Two way cable TV systems for local communications in such settings as hospitals, industrial buildings, community centers and schools are discussed. Security systems for transmitting alarm messages and poach prevention are considered. (Contains 110 citations fully indexed and including a title list.)

536,529
PB85-861920/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Satellite Digital Communication Systems. 1970-June 1985 (Citations from the Engineering Index Data Base).
Rept. for 1970-Jun 85.
Jun 85, 153p
Supersedes PB84-867662.

This bibliography contains citations concerning technology of satellite digital communication systems. Topics include modulation and transmission analysis, signal processing and coding, time division multiple access systems, modulators, demodulators, on-board systems, integrated satellite terrestrial networks, packet switching, and demand assignment. Phase shift keying techniques, regenerative devices, forward error correction coding, space diversity systems, bit error rate, synchronization techniques, access protocols, noise immunity, and simulation techniques are discussed. (This updated bibliography contains 210 citations, 38 of which are new entries to the previous edition.)

536,530
PB85-862316/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Error Correction Codes: Communication Systems. 1975-June 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-Jun 85.
Jun 85, 153p
Supersedes PB84-867290.

This bibliography contains citations concerning error correction codes for communication systems. Digital, data, radio, and satellite communication systems are discussed. Correction procedures, error patterns, error randomization, and performance evaluation of communication error correction networks are presented. Discussions also include videotelephone and videoteleconference techniques. (This updated bibliography contains 192 citations, 25 of which are new entries to the previous edition.)

17D. Electromagnetic and Acoustic Countermeasures

536,531
AD-A153 791/9/GAR PC **A05**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Analysis of Jamming Effects on Noncoherent Digital Receivers.
Master's thesis,
H. Y. Joo. Dec 84, 78p

The effects of various jamming waveforms on conventional binary incoherent digital receivers was analyzed in terms of resulting receiver performance (i.e., receiver probability of error). Probability density functions associated with the test statistic generated by incoherent receivers under the influence of noise and jamming have obtained. Due to the complexity of the mathematical expressions specifying receiver probability of error in closed form, no attempt has been made to obtain absolute optimum jamming waveforms operating against binary incoherent receiver. Therefore, near optimum jammer signals were proposed, studied, and evaluated, The effect of a varying threshold on receiver performance was investigated and a jamming strategy involving use of an FM jammer was considered, and its effect evaluated. Graphical results are presented that highlight the mathematical results obtained.

17E. Infrared and Ultraviolet Detection

536,532
AD-A153 759/6/GAR PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Infrared Halo Effects Around Ships.
Memorandum rept. Sep 83-Sep 84,
I. B. Schwartz, K. A. Snail, and J. R. Schott. 29 Mar 85, 16p Rept no. NRL-MR-5529

Accurate infrared ship signature codes are needed by the Navy in order to predict signatures of existing ships, test algorithms used for detection, classification and homing, study signature reduction techniques, and reduce the IR detectability of future vessels. Currently, the signature codes being used by the Navy do not include contributions from radiation undergoing one or more reflections off surfaces between the ship and sensor. In most instances, reflected infrared radiation can be neglected since the absorptance of most reflecting surfaces (e.g. water, painted surfaces, etc.) is high in the infrared. However, for the case of grazing or near-grazing incidence on a water surface, the IR reflectivity becomes very large. Hence, low angle observations of the sea near a ship tends to show a warmer region in front of the ship; in rough seas the IR image of the ship's reflection is blurred into an infrared 'halo'. Recent infrared field measurements performed by NRL on the USS Ticonderoga clearly show the halo effect. In this report we determine the mean temperature difference between the halo and background for a Ticonderoga image, and then propose a simple one-dimensional model for the angular dependence of the halo's apparent temperature.

536,533
AD-A153 834/7/GAR PC **A08**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Infrared Detection of Surface Vehicle, Calculation Using Atmospheric Model LOWTRAN 6.
Master's thesis,
I. Egolfopoulos. Dec 84, 159p

The thermal signature of a destroyer, quantified by the signal to noise ratio of a thermal seeking missile head is parametrically investigated. The effects of the ship internal temperature, ship body paint emissivity, sky condition, sun elevation angle above the horizon, atmospheric profile, missile optics and flight altitude are examined in detail. Results show that both the ship body temperature and signal to noise ratio increase as the incident solar energy and the ship body paint emissivity increase and that the signal to noise ratio appears a pick for sun elevation angle in the range of 40 deg to 60 deg. Moreover the signal to noise ratio increases as the missile flight altitude decreases and keeping the other parameters constant higher values are found the Midlatitude summer atmospheric than for the Tropical atmosphere.

17G. Navigation and Guidance

536,534
AD-A153 565/7/GAR PC **A03**/MF **A01**
Rockwell International, Thousand Oaks, CA. Microelectronics Research and Development Center.
Passivation on High Q Acoustic Strain Sensor for Accelerometer.
Final technical rept. 14 Feb 82-13 Jul 84,
M. W. Motamedi. Nov 84, 39p MRDC-41108.3FR, AFOSR-TR-85-0281
Contract F49620-82-C-0012

The objective is to study the passivation effects on the frequency stability of SAW resonators. Cantilever SAW accelerometers based on the SAW resonator to be sensing element of acceleration is considered for a wide spectrum of Air Force applications. To produce the desired accuracy, a quartz beam is designed with the required sensitivity and a size adequate for the resonator structure. A theory of interface waves is developed for the purpose of material and thickness selection of passivation layers. Preliminary results indicated that Y2O3 (yttrium oxide) and AlN (aluminum nitride) were the best materials for passivation of SAW resonators.

536,535
AD-A153 634/1/GAR PC **A08**/MF **A01**
Defence Research Establishment, Ottawa (Ontario).
General Area Air Traffic Controller Simulation Using Colour Graphics,
B. J. Ford. Sep 83, 151p
Contract DREO-890
Original contains color plates: All DTIC and NTIS reproductions will be in black and white. Abstract in French.

The increased speed of aircraft and a greater density of air traffic are overtaxing air traffic controllers. Automation of some portions of the controller's information and the use of colour to highlight dangerous situations will make the controller's work easier and possibly more accurate. One of the major aims of the study is to show that the use of a different colours to indicate varying distances between aircraft is a definite improvement over a monochrome display. The other major aim is to study the advantages and disadvantages of vector display and raster display technologies when applied to the air traffic controller scenario. A new set of graphics display routines was developed to be used for the simulation. Much consideration was given to the best methods to optimize the display routines, with attention given to real-time constraints.

536,536
AD-A153 747/1/GAR PC **A03**/MF **A01**
Industrieanlagen-Betriebsgesellschaft m.b.H., Ottobrunn (Germany, F.R.).
Ada Compiler Validation Summary Report, University of Karlsruhe-GMD/German MoD Siemens - BS 2000 Version 7.XXX.
Final rept.
28 Nov 84, 48p

The purpose of this Validation Summary Report (VSR) is to present the results and conclusions of performing

standardized tests of the GMD/German MOD Compiler. On-Site testing was performed 27 SEP 84 to 8 OCT 84 at the GMD Center in Birlinghoven, Germany under the auspices of the Ada Validation Facility (AVF), according to the Ada Validation Office (AVO) policies and procedures. The GMD Compiler (Siemens 7.XXX Version 840404) is hosted on the Center's Siemens 7.571 Computer operating under BS2000 7.1. The suite of tests known as the Ada Compiler Validation Capability (ACVC), Version 1.4, was used. A complete list of tests and results is provided in this report.

536,537
AD-A153 799/2/GAR PC **A08**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Review and Evaluation of Plans to Incorporate NAVSTAR Global Positioning System User Equipment on Military Sealift Command Ships.
Master's thesis,
A. R. Foureman. Dec 84, 160p

The NAVSTAR Global Positioning System (GPS) is a spaced-based navigation system scheduled to be fully operational; by 1990. GPS User Equipment (UE) is scheduled for installation on Navy ships commencing 1987. This thesis examines plans to incorporate GPS UE on Military Sealift Command (MSC) ships. The Naval Auxiliary Force and Special Mission Support ships have been funded and scheduled for military GPS UE. Plans for Strategic Sealift and Miscellaneous Service Support ships have not yet been made. Alternatives for equipping these ships with either commercial or military GPS UE are examined. Primary recommendations for MSC ships when GPS is operational with two-dimensional coverage (by the end of 1987) are: (1) equip Strategic Sealift ships with military GPS UE, (2) include GPS navigation equipment in ship enhancement programs, and (3) require GPS UE in MSC time and voyage charters.

536,538
AD-A153 876/8/GAR PC **A02**/MF **A01**
Rockwell International, Thousand Oaks, CA. Microelectronics Research and Development Center.
Investigation of Fast Reaction SAW (Surface Acoustic Wave) Accelerometer.
Annual technical rept. 2 Oct 82-30 Sep 83,
M. E. Motamedi. Mar 85, 19p Rept no. MRDC41082.14AR
Contract MDA903-81-C-0081, ARPA Order-4061

The objective is to develp SAW accelerometers with improved bias stability characteristics for moderately accurate inertial navigation. Methods of fabricating dual-resonator crystals with low absolute and differential aging characteristics have been developed. Tests have been performed at 10 Gs acceleration on integrated noise levels for simulated guidance system mission times up to 20 min. Error rates less than 15 meters per hour in position of accuracy and velocity error less than 0.013 m/s have been achieved. Sensor device has a frequency stability of part in 10 to the 10th power with a dynamic range of 1,000,000. Simulation shows a bit quantization of 13/100m/s and frequency scale factor of 770 Hz/m/sq m can be achieved.

536,539
AD-A153 892/5/GAR PC **A04**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
TCAS II (Traffic Alert and Collision Avoidance System): Design and Validation of the High-Traffic-Density Surveillance Subsystem.
Project rept.,
W. H. Harman, and R. S. Kennedy. 12 Feb 85, 60p
ATC-126, DOT/FAA/PM-84/5
Contract DOT-FA77-WAI-817

This report summarizes a program conducted to design and evaluate TCAS II avionics, focusing on the air-to-air surveillance subsystem. The Traffic Alert and Collision Avoidance System (TCAS) is a system of airborne equipment being developed by the FAA for the purpose of preventing mid-air collisions. TCAS is intended as a collision avoidance backup to the existing system of air traffic control. In one mode of operation, TCAS would prevent a collision between two aircraft, each equipped with a unit called TCAS II. Each TCAS II would sense the presence of the other aircraft, measure its location (in range, altitude, and bearing), detect a hazardous situation if one develops, and then display a resolution advisory (such as climb or descend) to the pilot, after first carrying out an automatic coordination between the two aircraft to assure that the action taken by one aircraft will complement the action taken by the other aircraft. The TCAS II also affords protection against aircraft equipped with either Mode S or existing Secondary Surveillance Radar transponders. The TCAS II also affords protection against aircraft equipped with TCAS I which is a simpler form of TCAS.

536,540
PB85-861524/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gyrocompasses. 1972-May 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-May 85.
Jun 85, 167p
Supersedes PB84-865690. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning gyrocompass research, development, theory, design and applications. System features; systems installed in fixed-winged aircraft, helicopters and spacecraft; error measurement; maintenance, self-alignment and correction techniques; and stability are among the topics discussed. Strapdown systems, Kalman filtering, laser gyroscope compasses and selection of appropriate systems are also considered. (This updated bibliography contains 224 citations, 17 of which are new entries to the previous edition.)

536,541
PB85-861995/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gyroscopes and Gyro-Stabilized Systems. June 1983-June 1985 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 83-Jun 85.
Jun 85, 57p
Supersedes PB84-867100. Prepared in cooperation with National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning theory, design, developments, construction and applications of gyroscopes. Fiberoptic, superconducting, electrostatic, microelectrostatic and nuclear magnetic gyroscope variations are among the subjects discussed. Such applications as verifications of Einstein's theories, missile guidance, inertial navigation, platform stabilization and vibrational effects of gyroscope reliability are included. (This updated bibliography contains 63 citations, 10 of which are new entries to the previous edition.)

17H. Optical Detection

536,542
AD-A153 647/3/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Resolution of Closely Spaced Optical Targets Using MLE (Maximum Likelihood Estimator) and MEM (Maximum Entropy Method).
Journal article,
M. J. Tsai. Mar 82, 6p JA-5196, ESD-TR-85-042
Contract F19628-80-C-0002
Pub. in IEEE Transactions on Aerospace and Electronic Systems, vAES-18 n2 p209-213 Mar 82.

The capabilities of the maximum likelihood estimator (MLE) and the maximum entropy method (MEM) in resolving closely spaced optical point targets are compared using Monte Carlo simulation results for two different examples. It is found that the MEM is very sensitive to the noise and that the MLE performs better than MEM in both examples.

17I. Radar Detection

536,543
AD-A153 460/1/GAR MF **A01**
Army Missile Command, Redstone Arsenal, AL. Advanced Sensors Directorate.
Applications of Modern Spectral Estimation Techniques to Radar Data.
Technical rept.,
N. B. Lawrence, and R. C. Houts. Mar 84, 53p
AMSMI/RE-84-12-TR, SBI-AD-E950 682
Availability: Microfiche copies only.

The Modern Spectral Analysis (MSA) techniques involving linear prediction theory are reviewed and applied to radar signal processing. Specifically, the maximum entropy or forward-backward linear prediction method as implemented with Andersen's Burg algorithm is compared with the least-squares method as implemented with Marple's algorithm using as test signals autoregressive (AR) processes of 2nd and 4th orders plus single and dual sinusoids in Gaussian white noise. It is shown that Marple's indicators for terminating the AR model order iteration perform better than the more commonly employed Akike or Parzen techniques for both AR processes and noisy sinusoids. The concept is examined for using MSA to predict the AR coefficients of a clutter-dominated radar return, and in turn employing these coefficients as a FIR digital filter to suppress the clutter. Recent work on adaptive clutter filtering is reviewed. The ability of these two algorithms to resolve two closely-spaced sinusoids in a high noise environment is studied using Tranter's test signal. It is shown that model-order size rather than signal-to-noise (SNR) seems to be the dominant factor for SNR in the range of 10 to 30 dB. (Author)

536,544
AD-A153 550/9/GAR PC **A02**/MF **A01**
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Atmospheric Probing by Active Millimeter Wave System.
Final rept. 15 Mar-14 Jul 84,
R. Lhermitte. Mar 85, 19p ARO-18627.2-GS
Contract DAAG29-82-K-0082

The objectives of the contract are to design, assemble, and test a W-band Doppler radar operating at a frequency of 94 GHZ (lambda = 3.3 mm). The ultimate goal of the project is to use the radar in a cloud physics research program. The radar design is based on an MTI scheme in which the transmitter RF pulse produced by an Extended Interaction Oscillator phaselocks a Coho IF signal. A gunn diode oscillator phaselocked on a crystal oscillator signal provides the STALO input to the mixers. The radar is equipped with two separate transmitter and receiver antenna having a 3-foot diameter. The receiver mixer noise figure is 6.5 dB DSB and the transmitter power s 1.2 kW. Pulse width can be adjusted between 0.1 to 2 microns, and Pulse Repetition Rate between 2.5 to 20 KHZ. The radar is completed and tested. Test results indicate that the Doppler operation is satisfactory and that the minimum range at which the radar can operate is approximately 60 m (400 ns), as primarily limited by the IF amplifier recovertie. The Doppler radar is equipped with an on-line signal processor for real-time evaluation of mean Doppler frequency and mean signal intensity.

536,545
PATENT-4 506 269 Not available NTIS
Department of the Air Force, Washington, DC.
Laminated Thermoplastic Radome.
Patent,
E. E. Greene. Filed 26 May 82, patented 19 Mar 85, 7p AD-D011 664/0, PAT-APPL-6-382 070
Supersedes PAT-APPL-6-382 070, AD-D009 637.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

This patent discloses an improved rain resistance radome C-sandwich wall which is constructed of thermoplastic polycarbonate material. The cores are either posts or tubes and are bonded to the skins with polyurethane. The percentage of core material to air is adjusted by electrical tuning to make the optimum dielectric value for use in the gigahertz radar frequency range.

17J. Seismic Detection

536,546
AD-A153 795/0/GAR PC **A04**/MF **A01**
Teledyne Geotech, Alexandria, VA. Alexandria Labs.
Low Frequency Spectral Minimum in Underground Explosion P Spectra.
Technical rept. Nov 82-Nov 83,
G. Smart. 12 Jan 84, 57p Rept no. TGAL-TR-83-7
Contract F08606-83-C-0004, ARPA Order-4398

We confirm that a very low frequency discriminant, i.e., the hole due to pP interference, located at the lower extreme of underground nuclear explosion spectra, is preserved in short-period seismic recordings. This is shown repeatedly, from subarray to subarray, in comparisons of (Amchitka Test) LONGSHOT with a control earthquake, in recordings of those events made at LASA. The discriminant, previously neglected as falling outside seismometer spectral range, is available with present recording systems. To isolate the pP effect for observation the explosion spectra are, in effect, divided by the spectral of the control earthquake, removing interference of earth and instrument responses. It is not clear whether use of a control earthquake is unavoidable. Keywords include: Zero-frequency spectral hole; Depth of burial; and pP interference.

18. NUCLEAR SCIENCE AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

536,547
DE85005791/GAR PC **A04**/MF **A01**
Argonne National Lab., IL.
SPECTER: Neutron Damage Calculations for Materials Irradiations.
L. R. Greenwood, and R. K. Smither. Jan 85, 65p ANL/FPP/TM-197
Contract W-31-109-ENG-38

Neutron displacement damage-energy cross sections have been calculated for 41 isotopes in the energy range from 10 exp -10 to 20 MeV. Calculations were performed on a 100-point energy grid using nuclear cross sections from ENDF/B-V and the DISCS computer code. Elastic scattering is treated exactly including angular distributions from ENDF/B-V. Inelastic scattering calculations consider both discrete and continuous nuclear level distributions. Multiple (n,xn) reactions use a Monte Carlo technique to derive the recoil distributions. The (n,d) and (n,t) reactions are treated as (n,p) and (n, sup 3 He) as (n, sup 4 He). The (n, gamma) reaction and subsequent beta -decay are also included, using a new treatment of gamma - gamma coincidences, angular correlations, beta -neutrino correlations, and the incident neutron energy. The Lindhard model was used to compute the energy available for nuclear displacement at each recoil energy. The SPECTER computer code has been developed to simplify damage calculations. The user need only specify a neutron energy spectrum. SPECTER will then calculate spectral-averaged displacements, recoil spectra, gas production, and total damage energy (Kerma). The SPECTER computer code package is readily accessible to the fusion community via the National Magnetic Fusion Energy Computer Center (NMFECC) at Lawrence Livermore National laboratory. (ERA citation 10:023325)

536,548
DE85009292/GAR PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Material and Electromagnetic Properties of Faraday Shields for Ion Cyclotron Heating Antennas.
D. J. Hoffman, W. R. Becraft, F. W. Baity, J. B. O. Caughman, and C. C. Tsai. 1985, 20p CONF-850310-42
Contract AC05-84OR21400
Topical meeting on the technology of fusion energy, San Francisco, CA, USA, 3 Mar 1985.
Portions of this document are illegible in microfiche products.

The Faraday shields for ion cyclotron antennas must transmit magnetic waves and adsorb little rf power. To investigate these properties, we have constructed 27 Faraday shields in many configurations, including chevrons, tubes, straps, concentric rings, various layered shields, conventionally leafed straps, and replicas of the Faraday shields for ASDEX, the Joint European Torus (JET), TEXTOR, and Alcator-C. We have measured the magnetic flux and observed loading at various operating resistances by using dielectric sheets or magnetic-coupled loads. Each Faraday shield effects a net change in the characteristic inductance of the antenna, resulting in a reduction of wave coupling. However, the load experienced by the antenna is not always reduced because the Faraday shield itself acts as a load. We differentiate between these effects experimentally. The net result of the study is that the Faraday shields now in use cost up to a factor of 50% of coupling. This, of course, reduces the power handling capability by 50% as well. However, configurations exist that are easily cooled and result in a reduction of less than 5% in loading. (ERA citation 10:023327)

536,549
DE85009526/GAR PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Current Activities and Background of Technology Transfer and Exchange Program at Lawrence Livermore National Laboratory. Annual Report.
1984, 38p UCID-20357-84
Contract W-7405-ENG-48

Technology transfer activities are reported for the laser and magnetic fusion energy programs. (ERA citation 10:021428)

536,550
DE85009568/GAR PC **A02**/MF **A01**
Los Alamos National Lab., NM.
New Tritium Monitor for the Tokamak Fusion Test Reactor.
R. A. Jalbert. 1985, 5p LA-UR-85-962, CONF-850405-3
Contract W-7405-ENG-36
National topical meeting on tritium technology in fission, fusion and isotopic applications, Dayton, OH, USA, 30 Apr 1985.

At DT-fueled fusion reactors, there will be a need for tritium monitors that can simultaneously measure in real time the concentrations of HTO, HT and the activated air produced by fusion neutrons. Such a monitor has been developed, tested and delivered to the Princeton Plasma Physics Laboratory for use at the Tokamak Fusion Test Reactor (TFTR). It uses semipermeable membranes to achieve the removal of HTO from the sampled air for monitoring and a catalyst to convert the HT to HTO, also for removal and monitoring. The remaining air, devoid of tritium, is routed to a third detector for monitoring the activated air. The sensitivities are those that would be expected from tritium instruments employing conventional flow-through ionization chambers: 1 to 3 mu Ci/m exp 3 . its discriminating ability is approximately 10 exp -3 for any of the three components (HTO, HT and activated air) in any of the other two channels. For instance, the concentration of HT in the HTO channel is 10 exp -3 times its original concentration in the sampled air. This will meet the needs of TFTR. (ERA citation 10:023342)

536,551
DE85009591/GAR PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Comparison Study of Toroidal-Field Divertors for a Compact Reversed-Field Pinch Reactor.
C. G. Bathke, R. A. Krakowski, and R. L. Miller. 1985, 7p LA-UR-85-752, CONF-850310-44
Contract W-7405-ENG-36
Topical meeting on the technology of fusion energy, San Francisco, CA, USA, 3 Mar 1985.

Two divertor configurations for the Compact Reversed-Field Pinch Reactor (CRFPR) based on diverting the minority (toroidal) field have been reported. A critical factor in evaluating the performance of both poloidally symmetric and bundle divertor configurations is the accurate determination of the divertor connection length and the monitoring of magnetic islands introduced by the divertors, the latter being a three-dimensional effect. To this end the poloidal-field, toroidal-field, and divertor coils and the plasma currents are simulated in three dimensions for field-line tracings in both the divertor channel and the plasma-edge regions. The results of this analysis indicate a clear preference for the poloidally symmetric toroidal-field divertor. Design modifications to the limiter-based CRFPR design that accommodate this divertor are presented. (ERA citation 10:023340)

536,552
DE85009592/GAR PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Recent Progress in Stellarator Reactor Conceptual Design.
R. L. Miller. 1985, 10p LA-UR-85-753, CONF-850310-45
Contract W-7405-ENG-36
Topical meeting on the technology of fusion energy, San Francisco, CA, USA, 3 Mar 1985.

The Stellarator/Torsatron/Heliotron (S/T/H) class of toroidal magnetic fusion reactor designs continues to offer a distinct and in several ways superior approach to eventual commercial competitiveness. Although no major, integrated conceptual reactor design activity is presently underway, a number of international research efforts suggest avenues for the substantial improvement of the S/T/H reactor embodiment, which derive from recent experimental and theoretical progress and are responsive to current trends in fusion-reactor projection to set the stage for a third generation of designs. Recent S/T/H reactor design activity is reviewed and the impact of the changing technical and programmatic context on the direction of future S/T/H reactor design studies is outlined. (ERA citation 10:023341)

536,553
DE85009869/GAR PC **A05**/MF **A01**
Department of Energy, Washington, DC. Office of Fusion Energy.
Damage Analysis and Fundamental Studies. Quarterly Progress Report, October-December 1984.
Feb 85, 100p DOE/ER-0046/20
Contract AC06-76FF02170
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

Separate abstracts were prepared for each section. (ERA citation 10:023330)

536,554
DE85700239/GAR PC **A03**/MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
Thermal Capability of JT-60 Magnetic Limiter Plate.
T. Ando, and H. Nakamura. Dec 83, 31p JAERI-M-83-220
In Japanese.
U.S. Sales Only.

Thermal analysis of the JT-60 magnetic limiter (ML) plate has been made to investigate the thermal capability for its use in the ML operation. The following heat load models are considered to simulate the possible thermal conditions in the operation. Gaussian heat flux distribution with a half width of 3 cm is considered as charged particle heat load. In order to simulate the swing of the separatrix magnetic surface on the ML plate, both time averaged and sinusoidally moving heat flux are used. The effect of remote cooling by radiation (photon and charge exchanged neutral particle) in the ML region is modeled by the spacially distributed radiative heat sources. The ML plate is modeled by 2-dimensional slab geometry allowing interface conductance between the ML plate and the cooling duct. The effect of radiative heat transfer to the cooling duct and convective heat transfer to the cooling gas are included. Results show that in general the operation with the maximum heating pulse length of 10 s is not allowable in the absence of remote cooling. In a typical case when radiation loss in the ML region amounts to 70 % of the total power flow to the ML chamber, the power flow to the ML plate reduces by half and the peak heat flux also reduces by half or more. In addition, this heat flux is further decreased by half with +- 3.5 cm swing. This analysis presents the relationship between various heat loads and the ML

plate temperature and hence the thermally allowable operational range on the ML plate. (Atomindex citation 15:068984)

536,555
DE85700322/GAR PC **A02**/MF **A01**
Commission of the European Communities, Luxembourg.
1982 Annual Status Report: Thermonuclear Fusion Technology.
1982, 9p EUR-8525
U.S. Sales Only.

The objective of this programme is to study the technological problems related to "Post Jet" experimental machines and, in a longer range, to assess the engineering aspects of Fusion Power Reactor Plants. According to the decision taken by the Council of Ministers on the JRC multiannual programme (1980-1983), the work performed on 1982 concerns four projects, namely: The Project 1: "Fusion Reactor Studies" concerns mainly the NET (Next European Torus) studies which have been continued in the framework of the European participation to INTOR (INternational TOkamak Reactor). This represents a collaborative effort to design a major fusion experiment beyond the-upcoming generation of large tokamaks. The Project 2: "Blanket Technology" has the aim to investigate the behaviour of blanket materials in fusion conditions. The Project 3: "Materials Sorting and Development" has the aim to assess the mechanical properties and radiation damage of standard and advanced materials suited for structures, in particular for application as first wall of the fusion reactors. The Project 4: "Cyclotron Operation and Experiments" has the task to exploit a cyclotron to simulate radiation damages to materials in a fusion ambient. (Atomindex citation 16:000600)

536,556
DE85700513/GAR PC **A03**/MF **A01**
Verein zur Foerderung der Anwendung der Kernenergie, Graz (Austria). Reaktorinstitut.
Status of Neutronic Investigation for Fusion Blanket Design.
H. Rabitsch. Jun 84, 34p RIG-17
In German.
U.S. Sales Only.

This report gives a review of blanket concepts and methods for the determination of blanket parameters. Various studies and publications concerning neutronic analyses of blankets are cited. The conclusion of recent programs is a good agreement between measured results and theoretical calculations. (Atomindex citation 16:008136)

536,557
DE85750763/GAR PC **A03**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie.
Distillation Plant for Tritium Enrichment in Metallic Lithium.
E. Bernert, D. Butzek, J. Cordewiner, and E. Heinrichs. Jun 84, 31p Juel-Spez-259
In German.
U.S. Sales Only.

To close the external fuel cycle of fusion reactors, the tritium obtained from lithium must be separated off. One way of doing this is by high-temperature distillation and subsequent permeation. The construction of high-temperature distillation plant is described. For the time being, deuterium is processed instead of tritium. (ERA citation 10:019617)

536,558
DE85750770/GAR PC **A05**/MF **A01**
Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.).
Studies on the Feasibility of Heavy Ion Beams for Inertial Confinement Fusion.
May 84, 87p GSI-84-5
U.S. Sales Only.

The studies on the "Feasibility of Heavy Ion Beams for Inertial Confinement" funded by the German Ministry of Research and Technology have been continued in the same extent as in previous years. This annual report summarizes the scientific results of research carried out in the framework of this project at various research laboratories and universities. The principal aims of this research program are the identification and investigation of key issues of the heavy ion ICF concept based on a RF linac driver. Work done in 1983 concentrated on problems of accelerator and target physics: The theoretical investigations on the dynamics of high-intensity beams were continued. For the first time a low frequency RFQ for a high A/q ratio, to be used as a first unit of an injector, was put into operation. Theoretical target studies concentrated more on fundamental physics problems in the ICF targets, and on considerations for the generation of dense plasmas by intense beams of heavy ions. (ERA citation 10:019615)

536,559
DE85780467/GAR PC **A04**/MF **A01**
Netherlands Energy Research Foundation ECN, Petten.
Fusion Technology Program. Semi-Annual Report July-December 1983.
J. D. Elen. Jul 84, 73p ECN-157
U.S. Sales Only.

The report summarizes work performed in the following areas: system and safety studies for fusion reactors; nuclear data for fusion reactors; neutronics calculations for fusion reactors; radiation damage of vanadium alloys and stainless steel 316; facility for in-pile crack growth measurement; niobium tin magnet for Sultan - stage II; development of NET conductor; and development of ceramic tritium breeding materials. (Atomindex citation 15:073359)

18B. Isotopes

536,560
DE85700283/GAR PC **A02**/MF **A01**
Risoe National Lab., Roskilde (Denmark).
Utilization of the Isotopic Composition of Xe and Kr in Fission Gas Release Research.
M. Mogensen. Jun 84, 19p RISO-M-2437, CONF-830563-6
Enlarged halden program group meeting, Loen, Norway, 23 May 1983.
U.S. Sales Only.

Two examples of how the measured fission gas isotopic composition can be used in the study of fission gas release phenomena are given. In the first example the ratios of Kr85/Kr86 in release and retained gas are used for calculation of the "average time" when the gas was released. This "average time" may be used in code qualification. In the second example the degree of conversion of unstable Xe135 to stable Xe136 is derived from the measured ratio of Xe136 to Xe131+132. This conversion is of importance in the calculation of the total Xe generation during irradiation. (Atomindex citation 15:069382)

536,561
DE85750771/GAR PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Datenverarbeitung in der Technik.
Calculated Release of Iodine under Different Operation Conditions.
K. Nagel, and J. Wolt. Oct 84, 25p KFK-3821
In German.
U.S. Sales Only.

On the basis of experimental results using Passat, a prototype of a head-end filter facility, we investigated deterministically the release of iodine by dissolver offgas. The retention factor of the iodine filter is influenced by relative humidity of the off-gas and the available bed depth of the sorption filter. The relative humidity will be determined by off-gas temperature. The experimentally known dependence of the iodine retention factor on filter bed depth and relative humidity is described using four different two-dimensional approximations. For two kinds of dissolution processes of spent fuel: batchwise operation and dosage of acid, the release of iodine has been calculated under different operation conditions: normal facility operation and failure of the electric heaters. (ERA citation 10:017967)

536,562
PB85-195691/GAR PC **E03**/MF **E01**
Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center.
Introduction to Technetium-99m Generators,
S. Abrashkin. Feb 84, 21p IA-1392

The role played by technetium-99m generators in diagnostic medicine, their physical and chemical fundamentals, and their main technical characteristics are discussed. This report is intended as a general introduction to a group of reports which summarize the work done on the development and production of the generators, and research on the chemical and physical aspects of the generator systems.

18D. Nuclear Instrumentation

536,563
DE85006474/GAR PC **A05**/MF **A01**
Bendix Field Engineering Corp., Grand Junction, CO.
Operating Manual for the Radon-Daughter Chamber.
G. H. Langner, and T. Nelson. Jan 85, 97p GJ/TMC-18
Contract AC07-76GJ01664

A radon-daughter chamber was constructed at the US Department of Energy (DOE) Grand Junction Projects Office (GJPO) facility for the purpose of calibrating, testing and evaluating radon and radon-daughter measuring instruments used in support of DOE remedial action programs. The chamber is an environmentally controlled cylindrical vessel through which air containing radon can be circulated. Environmental parameters within the chamber and their respective controllable ranges include radon concentration (1 to 1000 pCi/1), ventilation rate (0.25 to 10 air changes per hour), temperature (0 to 45 deg C), dew point (-10 deg C to saturated), and condensation-nuclei concentration (10 to 10 exp 6 /cm exp 3). (ERA citation 10:022438)

536,564
DE85700418/GAR PC **A02**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Measurement of Depth Dose Factors for Various sup 60 Co and X-Ray Beams Using Ion Chambers and Thermoluminescent Dosemeters. Final Report for the Period 1 May 1982-30 April 1983.
A. Ramain. Jul 83, 15p IAEA-R-3087-F
U.S. Sales Only.

An NPL secondary standard ionization chamber is used for calibration TLD inside the water phantom, exposed to sup 60 Co, gamma rays and X-rays. (Atomindex citation 16:003294)

536,565
DE85700419/GAR PC **A05**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Measurement of Environmental Radioactivity in Tokl District, (2). Comparative Measurement with Various Instruments.
Jul 83, 88p IPPJ-DT-105
In Japanese.
U.S. Sales Only.

Three and a half years have elapsed since the start of this joint research. At first, cosmic ray was measured with a Geiger counter made by ourselves, then strong radioactivity was found in soils and stones. In order to observe the natural environment in which we live from the viewpoint of radiation, the measuring instrument having better sensitivity and on which the effect of background is small was sought for. The main subject of this report is the progress during this period, accordingly, the circuit composition of a NaI scintillation counter, thermoluminescent dosimeter and ionization chamber measurement are described. When the Tokitsu Elementary School was reconstructed from wooden structure to concrete structure, the exposure dose in the teacher's room doubled. One summer day, mutual comparison was carried out among the measurement with a Geiger counter, a NaI scintillator and a TLD using an ionization chamber as the reference. The features of various measuring instruments were clarified, and utilizing these results, the effect of the combined measurement can be obtained. (Atomindex citation 16:003296)

536,566
DE85700421/GAR PC **A04**/MF **A01**
Uppsala Univ. (Sweden). Inst. of Tech.
Multiplicity Trigger for a Cherenkov Detector.
P. Jonsson. May 84, 58p UPTEC-8445-E
U.S. Sales Only.

The Multiplicity Trigger (MT) is a device for deciding if, in a given time window, the number of wires that are hit in a multiwire proportional chamber (MWPC) is within given limits. The MT is designed for a Cherenkov detector, using a MWPC with 155 sense wires. It has ten inputs with sixteen channels on each, for 160 ECL input signals from the MWPC. With the MT, it is possible to decide if the number of hits is greater than n out of 160, where n is called the multiplicity. Here, $2 < n < 30$, with an accuracy of +- 1. The time window can be adjusted from 0.7 to 4 mu s. The MT has four separate NIM outputs, to make it possible to have four different values of n at the same time. The propagation delay from input to output is at the most 100 ns. (Atomindex citation 16:003334)

536,567
DE85700546/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Precise Determination of Photopeak Width.
O. A. M. Helene. Mar 83, 13p IFUSP-P-387
U.S. Sales Only.

The feasibility and application of very precise determination of photopeak widths observed with Ge(Li) and hyperpure Germanium detectors, are discussed. (Atomindex citation 16:008983)

536,568
DE85700547/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Angular Dependence of Cathodic Induced Signals in a Cylindrical Proportional Detector.
C. M. Tur, and B. Marechal. 1982, 20p UFRJ-IF-07/82
U.S. Sales Only.

A cylindrical proportional counter with a cathode consisting of eight independent sectors, is used to analyse the pulse height distribution of the induced signals as a function of the polar angle. This distribution is found to be anisotropic, which can in fact be explained assuming that the avalanche does not uniformly surround the anode wire. (Atomindex citation 16:008986)

536,569
DE85750283/GAR PC **A03**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Test of a High Resolution Drift Chamber Prototype.
V. Comminchau, M. Deutschmann, K. J. Draheim, P. Fritze, and K. Hangarter. Jun 84, 40p DESY-84-049, CONF-8405241-2
Seminar on perspectives for experimental apparatus at future high energy machines, Florence, Italy, 21 May 1984.
U.S. Sales Only.

The performance of a drift chamber prototype for a colliding beam vertex detector in a test beam at DESY is described. At one (two) atmosphere gas pressure a spatial resolution of 40 mu m (30 mu m) per wire for one cm drift length was achieved with a 100 MHz Flash-ADC system. An excellent double track resolution of better than 300 mu m over the full drift length of 5 cm can be estimated. (ERA citation 10:011559)

536,570
DE85750302/GAR PC **A02**/MF **A01**
Max-Planck-Inst. fuer Physik und Astrophysik, Munich (Germany, F.R.). Werner-Heisenberg-Inst. fuer Physik.
Tower Structured Scintillator-Lead Photon Calorimeter Using a Novel Fiber Optics Readout System.
H. Fessler, P. Freund, J. Gebauer, K. M. Glas, and K. P. Pretzl. Jun 84, 18p MPI-PAE/Exp.El.-132
U.S. Sales Only.

Described is the construction and the performance of a tower structured scintillator-lead photon calorimeter using a novel fiber optics readout system. The calorimeter is divided into 9 individual towers. Each tower has a cross section of 5x5 cm exp 2 and consists of 60 layers of 2 mm lead plus 5 mm thick scintillator. The four sides of each tower are covered by thin acrylic sheets (1.5 mm thick) doped with a wavelength shifting material. The light produced in each scintillator plate is first converted in these sheets, then converted a second time in a set of polystyrene optical fibers (diameter 2 mm) which run longitudinally through the calorimeter along the corners of each tower. A small diameter photomultiplier was attached to the fibers at the back end of the calorimeter. The obtained energy resolution with incident electrons in the range of 0.25 - 5.0 GeV/c is sigma/E = 0.10/ sqrt E. The uniformity of response across the front face of each tower was measured. (ERA citation 10:011564)

536,571
DE85750516/GAR PC **A03**/MF **A01**
Max-Planck-Inst. fuer Physik und Astrophysik, Munich (Germany, F.R.). Werner-Heisenberg-Inst. fuer Physik.
Results from a CsI(Tl) Test Calorimeter with Photodiode Readout Between 1 and 20 GeV.
H. Grassmann, H. G. Moser, E. Lorenz, and H. Vogel. Aug 84, 29p MPI-PAE/Exp.El.-136
U.S. Sales Only.

Results from a test with a CsI(T1) calorimeter will be presented. The purpose was to evaluate the use of CsI(T1) for high resolution electromagnetic calorimetry. A resolution of about 1% has been measured between 4 and 20 GeV. A very high electron/hadron separation of > 1:1000 has been observed. Prospects and limitations for large scale applications will be discussed. (ERA citation 10:018966)

536,572
DE85750519/GAR PC **A03**/MF **A01**
Max-Planck-Inst. fuer Physik und Astrophysik, Munich (Germany, F.R.). Werner-Heisenberg-Inst. fuer Physik.
Silicon Detectors.
R. Klanner. Aug 84, 26p MPI-PAE/Exp.El.-135, CONF-8405241-3
Seminar on perspectives for experimental apparatus at future high energy machines, Florence, Italy, 21 May 1984.
U.S. Sales Only.

The status and recent progress of silicon detectors for high energy physics is reviewed. Emphasis is put on detectors with high spatial resolution and the use of silicon detectors in calorimeters. (ERA citation 10:018965)

536,573
DE85750650/GAR PC **A02**/MF **A01**
Lyon-1 Univ., Villeurbanne (France). Inst. de Physique Nucleaire.
Time of Flight Spectrometry in Heavy Ions Backscattering Analysis.
A. Chevarier, and N. Chevarier. May 83, 12p LYCEN-8320, CONF-830570-8
International conference on ion beam analysis, Tempe, AZ, USA, 22 May 1983.
U.S. Sales Only.

Time of flight spectrometry for backscattering analysis of MeV heavy ions is proposed. The capabilities and limitations of this method are investigated. Depth and mass resolution obtained in measurements of oxide films thickness as well as in GaAs layers analysis are presented. The importance of minimizing pile-up without significant loss of resolution by use of an adequate absorber set just in front of the rear detector is underlined. (ERA citation 10:014326)

536,574
DE85750721/GAR PC **A04**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Kernphysik.
Program to Calculate the Efficiency of a 4 pi Scintillation Detector.
G. Schatz, and J. Oehlschlaeger. Jul 84, 73p KFK-3710
In German.FORTRAN.
U.S. Sales Only.

A FORTRAN program is described which allows the calculation of the efficiency of a 4 pi scintillation detector for gamma rays. The detector has the shape of a hollow sphere with the gamma ray source at the centre. The program calculates the distribution of the energy deposited in the scintillator for the materials bismuth germanate or barium fluoride. (ERA citation 10:014314)

536,575
DE85750778/GAR PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Hauptabteilung Sicherheit.
Alpha -Spectrometric Device Equipped with Semiconductors for Direct Measurement of Transuranium Elements on Large Area Filters.
H. Fessler, and J. Pawelzik. Oct 84, 25p KFK-3783
In German.
U.S. Sales Only.

A device was developed with an array of 8 silicon surface barrier detectors inside a vacuum chamber containing a rotating sample holder for large area (200 mm diameter) aerosol filters. It serves for quick identification of alpha -emitters on these aerosol filters, and allows to measure the alpha -particles with a relatively constant efficiency along a filter diameter. Thus, the radiochemical treatment of single filters can be avoided. Troubles appeared in the course of development of defective semiconductors and their temperature dependence. To suppress the influence of temperature a cooling device was built. During practical testing a cross-efficiency of 13.6% was measured. It is possible to identify alpha -emitting nuclides with an activity of 10 exp -1 Bq per sample during about 2 hours of measuring time. Appropriate methods of calculation are indicated. The data output of the device is suited for transfer to a computer. (ERA citation 10:018962)

536,576
DE85750779/GAR PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Hauptabteilung Sicherheit.
Nitrogen Large Area Proportional Counter with Gas Regeneration.
L. Leidner, and E. Sadri. Oct 84, 23p KFK-3780
In German.
U.S. Sales Only.

A nitrogen large area proportional chamber with gas regeneration is introduced to measure alpha and beta/gamma activites. In contrast to the flow counters used till now the new detector is independent of an external gas supply. The gas amplification factor of nitrogen keeps constant up to an impurity of 2% of O sub 2 . Oxygen diffusing through unavoidable leakages into the counting gas is removed by an activated catalyzer using low temperature copper oxidation. Humidty is adsorbed by a molecular sieve. The closed counter consists of three components: the actual detector, a gas purification cartridge and a gas circulating pump. Finally, the report describes long run experiments being carried out with prototypes. (ERA citation 10:018961)

536,577
DE85750926/GAR PC **A05**/MF **A01**
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses (France).
Impulse Response Calculation for a P.I.N. Silicon Detector Irradiated by a Dirac Function of Radiation (Gamma or Proton).
P. Hass. May 84, 82p CEA-R-5267
In French.
U.S. Sales Only.

In order to explain the observed differences in the impulse responses measured with P.I.N. silicon junctions for several proton energies, we have calculated this response with the knowledge of the total thickness of silicon; the inverse applied BIAS; the energy of protons or gamma (with or without electronic equilibrium in the detector). This calculation does not take into account the plasma effects in the detector. After unfolding of the both measured and calculated responses by the mean of the function 1/RC.esup(-t/RC) (R and C are the components of the effective electrical circuit for the detector charge impedance), we obtain the time function I(t) of the current generated by the P.I.N. junction. The comparison between these both calculated and measured I(t) functions shows very well the plasma effects in the detector, especially for proton ranges shorter than the total thickness of the detector. (ERA citation 10:021544)

536,578
DE85750927/GAR PC **A05**/MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).
Calibration of a Recoil Proton Telescope Used for Intense Neutron Pulse Measurements.
P. Haas. May 84, 90p CEA-R-5264
In French.
U.S. Sales Only.

The best possible accuracy is required for the measurement of intense neutron flux delivered by short sources studied at the French "Commmissariat a l'Energie Atomique". Among all the neutron detectors available, recoil proton telescopes (R.P.T.) are the only ones that can be easily calibrated in the laboratory. R.P.T. presently used are composed of two different types of proton detectors: plastic scintillators (NE 102)

associated either with photo-electric cells or with photomultipliers; P.I.N. silicon junctions. The calibration of these different devices of detection is the matter of this work: measurements of the proton sensitivity Sdsub((Ep)) for the R.P.T. associated detectors; measurement of the number of recoil protons collected by the R.P.T. irradiated by monoenergetic neutrons; measurement of the impulse response of the R.P.T. associated detectors. (ERA citation 10:021543)

536,579
DE85780457/GAR PC **A02**/MF **A01**
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German D.R.)
Method for the Measurement of Fission Rates in Fast Neutron Fields Using Solid State Track Detectors.
W. Hansen, and W. Vogel. Apr 84, 14p ZfK-523
U.S. Sales Only.

Solid state track detectors (SSTDs) are increasingly used for the registration of radiation in different fields of nuclear physics. Because of their small sizes and masses and the absence of any electronics during exposure SSTDs do not cause distortions in the system to be investigated and are useful for measurements at such places being difficult of access. The elaboration of a method is described for fission rate measurements in fast neutron fields appying SSTDs and different fissionable isotopes which were electrodeposited on stainless steel backings. Experiences of the electrodeposition and results of quality checks are presented. The evaluation of the etched tracks is performed with spark counter technique. The dependence of the counting result on essential influence parameters is discussed. (Atomindex citation 15:073114)

536,580
DE85780458/GAR PC **A02**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Three-Dimensional Track and Vertex Fitting in Chambers with Stereo Wires.
D. H. Saxon. May 84, 18p RAL-84-044
U.S. Sales Only.

A formalism has been developed, and used in the TASSO experiment, for track fitting and geometrical vertex fitting in a uniform magnetic field. A two-dimensional fit, suitable for many detectors, has been extended into three dimensions in the case of cylindrical drift chambers with small-angle stereo measurements. Error matrices are calculated which are suitable for input to subsequent calculations. Multiple scattering is approximated by a model. (Atomindex citation 15:073190)

536,581
DE85780459/GAR PC **A02**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Micro Vertex Detector Design for Collider Geometries.
M. Atkinson, D. Crennell, C. M. Fisher, P. Hughes, and N. Kurtz. May 84, 13p RAL-84-052
U.S. Sales Only.

Previously the analysis of fixed target jet events using a scintillating optical fibre target to provide a projection of the topology on the plane transverse to the event axis has been considered. It was argued that this transverse plane projection is optimal for the detection of charm or beauty particle decay vertices. The idea is generalised to a jet analysis in a collider geometry particularly when associated with a high Psub(perpendicular to) or missing Esub(T) trigger. This report proposes a simple arrangement of fibres to give high precision track elements in the transverse plane projection coupled with a fast read-out capability. The principle physics aim of the design is to provide a tag for selecting top quark jets by detecting a beauty flavoured particle in the jet. (Atomindex citation 15:073191)

536,582
DE85780486/GAR PC **A03**/MF **A01**
Universidade Federal de Pernambuco, Recife (Brazil). Dept. de Energia Nuclear.
Determination of Photopeak Efficiency for a NaI (Tl) Well Scintillation Detector.
M. A. de Albuquerque. 1982, 41p INIS-BR-161
In Portuguese.
U.S. Sales Only.

The photopeak efficiency for a NaI (Tl) well-type detector was experimentally determined. The results obtained by calculating the total peak area, showed that the efficiency reaches its maximum at 140 KeV (gamma radiation energy) decreasing for energies higher than this value. Considering that 33.2 KeV corresponds to photoelectric absorption of the iodine K layer in the detector, it would be expected that the efficiency would decrease towards this value of the incident radiation energy; nevertheless, it was observed that the drop in efficiency occurs around 60 KeV. This phenomenon could then be explained by the compton effect caused by the degradation of gamma energy due to source packing, also provoking absorption of gamma radiation by the iodine K layer in the NaI detector. (Atomindex citation 15:073121)

536,583
DE85780487/GAR PC **A06**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Coordenacao dos Programas de Pos-graduacao de Engenharia.
Multichannel Analyzer Based on Microprocessors.
Tese (M.Sc.),
M. Soares. Jun 83, 104p INIS-BR-189
In Portuguese.
U.S. Sales Only.

A multichannel analyser for nuclear spectrometry, that would attend the needs of research laboratories and could be industrialized in Brazil, was developed. The design was based on INTEL 8080/85 microprocessors; other processors were also used to implement specific functions, such as shared busbar using direct memory access. A prototype was developed and tested through simulation, using a nuclear spectrometry chain. The results were fully satisfactory. (Atomindex citation 15:073122)

536,584
DE85780488/GAR PC **A04**/MF **A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Some Characteristics of the CR-39 Solid State Nuclear-Track Detector for Protons and Low Energy alpha Particles.
Tese (M.Sc.),
E. S. da Fonseca. 1983, 65p INIS-BR-224
In Portuguese.
U.S. Sales Only.

Experimental results related to certain registration properties of the CR-39 solid state nuclear-track detector for charged particles are presented and discussed. The determination of the CR-39 chemical etching in NaOH and KOH solutions, comprising concentration (2-10N) and temperature effects (50-90 exp 0 C), showed the existence of an inverse proportion between the induction time and the temperature as well as the normal concentration of the solutions. The critical energy and the critical energy-loss rate of CR-39 track detectors for registration of protons were experimentally determined. A number of samples was exposed to 24MeV proton beams in the IEN-CNEN Cyclotron (CV-28), using a scattering chamber with a tantalum thin target and aluminium absorbers in contact with the samples in order to provide the required fluctuation in the scattered beam energy. From the mean track-diameter plotted against incident proton energy for 16h and 24h chemical etching (6.25 NaOH, 70 exp 0 C), and considering 1.5 mu m as the minimum observable track-diameter, the values (21.0 + - 1.5) MeV and (22.5 + - 1.5) MeV were deduced, respectively, for the critical energy. From the calculated energy-loss rate versus energy curve, the critical energy-loss rate was evaluated as 24 + - 2 MeV.cm exp 2 /g. Finally, the CR-39 response for low energy alpha particles (E < = 6 MeV) was studied. It was demonstrated also that successive chemical etchings do not produce the same track geometry as obtained by means of a continuous revelation with the same total etching time. (Atomindex citation 15:073123)

536,585
DE85780522/GAR PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Computational Response Study of Personal and Albedo Neutron Dosemeters Composed of Solid State Track Detectors Based on (n, alpha) Reaction.
J. Palfalvi. Mar 84, 11p KFKI-1984-26
In Hungarian.
U.S. Sales Only.

The combined effect of incident and albedo neutrons on the response of several fission and (n, alpha) track detectors was investigated by calculations for monoenergetic neutrons and for neutrons from different energetic sources. The response functions are presented in tables and plots. (Atomindex citation 15:062105)

536,586
DE85780523/GAR PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Study on the Fast Neutron Sensitivity of Thermoluminescent Detectors.
P. P. Szabo, and J. Palfalvi. Mar 84, 18p KFKI-1984-36
In Hungarian.
U.S. Sales Only.

Fast neutron (14.7 MeV) sensitivity of several thermoluminescent detectors was determined. The investigated detectors were MTS-N type pellets (made in Poland) used routinely in the authors' institute for personnel dosimetry, sup 7 LiF powder used for accident dosimetry, CaSO sub 4 :Dy and CaSO sub 4 :Tm powders (made in Hungary) used for enviromental monitoring and space dosimetry. Both free-in-air and on-phantom irradiations were performed. The new results are compared with responses calculated and measured earlier. (Atomindex citation 15:062106)

536,587
DE85780558/GAR PC **A02**/MF **A01**
Tokyo Univ. (Japan). Inst. for Nuclear Study.
Calculation of the Performance of the INS Iron-Free pi Sqrt 2 Spectrometer as a Spectrograph.
M. Fujioka, M. Hirasawa, and H. Kawakami. Feb 83, 23p INS-J-166
U.S. Sales Only.

The performance of the INS iron-free pi sqrt 2 beta-ray spectrometer of the current-loop type is calculated with a view of using it as a spectrograph, i.e., in a multichannel mode with a position-sensitive proportional counter. For the momentum resolution of R = 0.01 and 0.1 % the usable momentum range as a spectrograph (exp + epsilon exp + < 2.5 and 5%, respectively) and the optimum baffle position (phi sub(B) = 25 exp 0) and the line shapes on the focal plane are calculated. The transmission of the baffle is 0.025 and 0.13 % of 4 pi and the expected gain of data-collection efficiency over the single-channel mode is 140 and 40 for R = 0.01 and 0.1%, respectively. An effective tilting of the focal plane due to the entrance baffle is discussed as well as the problems with arrangement and testing of the position detector. (Atomindex citation 15:064860)

536,588
DE85780559/GAR PC **A02**/MF **A01**
Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati.
Use of Multiple Coulomb Scattering in the Determination of Track Flight Direction in Fine Grain Detectors for Nucleon Decay Experiments.
G. Battistoni, H. Bilokon, P. Campana, V. Chiarella, and A. Ciocio. 1983, 7p INFN-LNF-83-11(R)
U.S. Sales Only.

Possibility to determine the orientation of a muon-like track with a good confidence level using multiple coulomb scattering is showed. The calorimeter considered uses 1 cm streamer tube planes spaced with 0.5 cm thick iron plates. It is found an efficiency of 90% for muons of 60 degrees of incidence and P=400 MeV/c. This technique can be used to check the topology of a nucleon decay candidate. (Atomindex citation 15:064864)

536,589
DE85780595/GAR PC **A05**/MF **A01**
Instituto Militar de Engenharia, Rio de Janeiro (Brazil).
Alpha Spectroscopy with Ionization Chamber to Determine Uranium and Thorium in Environmental Samples.
Tese (M.Sc.),
L. F. de Carvalho Conti. 1983, 93p INIS-BR-168
In Portuguese.
U.S. Sales Only.

A high-resolution, parallel Frisch ionization chamber with an efficient area of 320 cm exp 2 was developed and applied as an alpha spectrometer. The resolution of the spectrum is approximately 40 KeV fwhm (full width half maximum) for sup 233 U point source. The spectrum is recorded by a 1024 channels pulse-height analyser. The counting gas is commercial available mixture of argon and methane. The counting efficiency for sup 233 U energy-window selected is in order of

42% for a calibration source placed on the cathode axis. No radial dependence of this efficiency was observed. The chamber was used for counting the activity of uranium and thorium isotopes on large area stainless steel planchets. The large area thin sources were prepared extracting the uranium and thorium isotopes from 1M HNO sub 3 - aqueous solution with polymeric membranes containing tri-n-octyl-phosphine oxide adhered on the surface of the 314 cm exp 2 planchet. The integral back-ground is typically 7 counts/min between 4 and 6 MeV. The sensitivity of the procedure used for sup 238 U is about 30 Bq/1 based on 3S of back-ground, 1 liter sample volume and 30 min counting time. (Atomindex citation 15:068231)

536,590
DE85780622/GAR PC **A02/MF A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Polarisation Modulated Cross-Correlation Spectroscopy on a Pulsed Neutron Source.
R. Cywinski, and W. G. Williams. Jul 84, 23p RAL-84-062
Submitted for publication in Nuclear Instruments and Methods.
U.S. Sales Only.

A cross-correlation technique is introduced by which a total scattering polarisation analysis spectrometer on a pulsed neutron source can be modified to give full neutron polarisation and energy analysis without changing the physical configuration of the instrument. Its implementation on the proposed POLARIS spectrometer at the Rutherford Appleton Laboratory Spallation Neutron Source is described, and the expected dynamic (Q, omega) range and resolution evaluated. (Atomindex citation 15:070412)

536,591
DE85780623/GAR PC **A02/MF A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Development of a Prototype Tapered Cell Drift Chamber.
J. A. Blissett, D. K. Hasell, E. W. Kendall, B. T. Payne, and D. H. Saxon. Jun 84, 21p RAL-84-050
U.S. Sales Only.

Drift chamber cells have been constructed and tested using an electron test beam facility at DESY. The cells were operated under different voltage conditions and with different gas mixtures at 1 bar. Aspects of the construction and operation are discussed. Resolutions were typically less than 100 microns. The dependence of the drift cell resolution on distance from the sense wire and operating conditions are presented. (Atomindex citation 15:070421)

536,592
DE85780624/GAR PC **A02/MF A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Charge Sensitive Anode Pre-Amplifier for Use in MWPC Imaging Systems.
R. Stephenson, and P. Biggs. Mar 84, 23p RAL-84-034
U.S. Sales Only.

The PAG 438 charge sensitive anode signal pre-amplifier which is specifically designed for use in imaging MWPC (Multiwire Proportional Chambers) applications is described. It provides a fast trigger with a sensitivity of 5 x 10 exp 4 e exp - and a double pulse capability of 40 ns, along with a baseline restored analogue output suitable for pulse height selection at rates approaching 1 MHz. (Atomindex citation 15:070433)

536,593
DE85780627/GAR PC **A02/MF A01**
UKAEA, Winfrith (England). Atomic Energy Establishment.
Testing of Superscreened Coaxial Cable Made from Arylef and Polyetheretherketone.
F. H. Allen, and M. C. Davies. May 84, 25p AEEW-R-1775
U.S. Sales Only.

Two 500 metre lengths of cable, one using Arylef (Polyarylate) as its dielectric and outer sheath and the other PEEK, (Polyetheretherketone) were successfully manufactured. Both were subjected to a series of tests aimed at demonstrating their suitability for use with radiation detectors. Arylef proved to have little advantage over cables already in use, but PEEK showed superior radiation and temperature resistance to anything present employed. This material may have wide application in cables for difficult environments. (Atomindex citation 15:070503)

536,594
DE85780701/GAR PC **A07/MF A01**
Paris-6 Univ. (France).
Experimental Determination of the Energy Absorption Mass-Coefficient of Light Elements: Application to Carbon and Beryllium within Energy Range of 60 and 150 KeV.
These (3e Cycle),
L. Andre. Jun 82, 140p FRNC-TH-1582
In French.
U.S. Sales Only.

The principle of the measurement method is presented, together with the different relations giving the energy absorption mass coefficient for a given material sample. Mathematic simulation of the different interactions in the diffuser is exposed. Experimental device is described, characteristics of the curved crystal used, Ge-Li diode for attenuation measurements, NaI(Tl) crystal for diffusion measurements and monitorage. Characteristics of the scintillator are studied: pulse spectra, resolution, response function. Attenuation and energy absorption mass coefficient experimental results are presented and compared to different works. (ERA citation 10:014286)

536,595
DE85780702/GAR PC **A05/MF A01**
Paris-6 Univ. (France).
Contribution to Neutron Spectrometry Using Liquid Scintillator and Which is Applicable to Radioprotection.
These (3e Cycle),
P. Bonneau. Nov 82, 95p FRNC-TH-1549
In French.
U.S. Sales Only.

Because an electromagnetic radiation is emitted simultaneously with neutron emission, a liquid scintillator (type NE 213) has been chosen, which reacts selectively with the incident radiation nature. An impulse analysis electronic device allows to separate photon and neutron relative contributions. The different physical processes, created in the scintillating medium, give a deformed image of the incident neutron initial spectrum. Consequently, a mathematical treatment, taking into account those numerous reactions together with detector generated perturbations, is necessary to recover the real neutron spectrum and to deduce the fluence. (ERA citation 10:014284)

536,596
DE85780759/GAR PC **A06/MF A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie.
Development and Optimization of a High Temperature Coupling System Thermoanalyzer/Mass Spectrometer.
Diss,
H. J. Jagdfeld. Nov 83, 114p Juel-Spez-227
In German.
U.S. Sales Only.

The development of a high temperature coupling system was accomplished to carry out thermodynamic investigations during glass melting to solidify highly radioactive fission products into glass at a temperature up to 1200 deg C. The actual problem consisted of the fact that the gas species evaporating from the melter have to pass without condensation or without change of their composition to a multistage pressure reducing system to enter the analysis unit of the mass spectrometer in to high vacuum. With the systems offered at present this is only possible up to approximately 450 deg C. The development of a new high temperature coupling included investigations of the gas dynamics, raw materials and thermic behaviour. (ERA citation 10:018959)

536,597
DE85780798/GAR PC **A02/MF A01**
Instituto de Radioprotecao e Dosimetria, Rio de Janeiro (Brazil).
Radon Measurements Technique in Air Using a Track Plastic Detector.
J. F. A. Pereira, J. J. da Silva Estrada, D. A. C. Binns, and M. Urban. 1983, 18p INIS-BR-219
In Portuguese.
U.S. Sales Only.

A diffusion chamber is used to measure the radon concentration in air through alpha particles tracks in Makrofol E, 300 mu m thick. This system was developed by Karlsruhe Nuclear Research Centre, Germany, and is already used by the Occupational Radiological Protection Department of IRD/CNEN, for preliminary measurements in Pocos de Caldas and Rio de Janeiro. In the chamber, the plastic detector is set at the lower end and a filter is placed at the upper end. In this way, a known volume is defined in the detector system. To amplify the tracks produced by the alpha particles due to radon and short-lived radon-daughter products, an electrochemical system is employed. Some theoretical questions about the treeing produced by the electrochemical etching, the detector characteristics, as well as the adapted statistics model are also discussed. (Atomindex citation 16:003295)

536,598
PB85-182426/GAR PC **E03/MF E03**
Ministry of Agriculture, Fisheries and Food, Lowestoft (England). Directorate of Fisheries Research.
Automatic Sample Changer for Gamma Spectrometry.
Technical rept.,
D. J. Andrews. c1984, 15p FISHERIES RESEARCH TR-77

Monitoring of the environment for radioactivity, especially of artificial origin, is an important aspect of the role of the Directorate of Fisheries Research of the Ministry of Agriculture, Fisheries and Food (MAFF) at Lowestoft in meeting statutory responsibilities for the control of radioactive waste discharges to the aquatic environment. This requires the collection and radiometric analysis of a large number of environmental samples. The automatic sample changer described here is suitable for use with most existing gamma spectrometry systems which utilize germanium lithium (GeLi) or sodium iodide (NaI) detectors in vertical mode, in conjunction with a pulse height analyser having auto-cycle and suitable data output facilities; it is linked to a Nuclear Data ND 6620 computer-based analysis system. It is designed for large-volume, low-activity environmental samples of various sizes up to maximum dimensions 100 mm diameter x 60 mm high.

536,599
PB85-185114/GAR PC **E04/MF E04**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Developments in Solid State Vertex Detectors,
C. J. S. Damerell. c1984, 69p RAL-84-123
Presented at the Slac Summer Institute, 1984.

Since the discovery of the J/Psi in November 1974, there has been a strong interest in the physics of particles containing higher-flavor quarks (charm, bottom, top, ...). High precision vertex detectors can be used to identify the decay products of parent particles which have lifetimes of the order 10 to the -13th power s. This paper surveys the progress which is being made in developing silicon detectors with the necessary tracking precision (about or $<$ 5 micrometers) to be used for this purpose in fixed target experiments and also in colliders such as SLC and LEP. The lectures on which the paper is based were designed for an audience not consisting of specialists in the field of silicon detectors.

536,600
PB85-185957/GAR PC **E05/MF E05**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Tests of a Prototype Resonance Filter Spectrometer at WNR (Weapons Neutron Research),
R. J. Newport, P. A. Seeger, and W. G. Williams. c1984, 86p RAL-84-113
Prepared in cooperation with Los Alamos National Lab., NM.

Data gained during a series of developmental experiments using the SNS test resonance filter spectrometer at the WNR pulsed neutron facility, Los Alamos, are presented and discussed. The operational experience obtained during the period of these studies has provided some insight into the desirable characteristics and possible limitations of any future spectrometer design, and this information is considered in some detail. (Copyright (c) Science and Engineering Research Council 1984.)

536,601
PB85-187953/GAR PC A03/MF A01
Office of Radiation Programs, Washington, DC.
Methods for Measurement of (222)Rn Emissions from Underground Uranium Mines.
P. O. Jackson. Aug 84, 38p EPA/520/1-85/012
Sponsored by Department of Energy, Washington, DC.

Three methods are described for use in monitoring the emission rate (activity per unit time) of 222Rn in ventilation air exhausted from active underground uranium mines. The methods include procedures for making (1) concentration measurements, (2) flow-rate measurements, and (3) emission rate calculations.

536,602
PB85-189595/GAR PC E04/MF E04
Commission of the European Communities, Luxembourg.
Data-Evaluation for Operator-Inspector Differences for a Specific NDA Instrument.
M. Franklin. c1984, 69p EUR-9230-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The Joint Research Center (JRC) of the European Commission is developing a number of NDA instruments for safeguards use. One such instrument, a photo neutron active interrogation device (Phonid) has been developed for the assay of U-235 in bulk quantities. This report describes new statistical results for the D statistic in the context of data evaluation algorithms for the Phonid instrument. The Phonid instrument is useful for this purpose because its error propagation structure is well characterized and yet not trivially simple. The data evaluation for Phonid data is derived from its error propagation modelling plus new results for the sampling distribution of the D statistic.

18E. Nuclear Power Plants

536,603
AD-A153 629/1/GAR PC A02/MF A01
Air Force Weapons Lab., Kirtland AFB, NM.
Overview of Reactor Concepts, a Survey of Reactor Designs.
Final rept.,
L. W. Lee, and J. Huff. Feb 85, 20p Rept no. AFWL-TN-84-37

Nuclear reactors have been a reliable energy source for many years. Commercial nuclear power plants have an unparalleled safety record. In fact, no power plants of conventional nature such as coal, petroleum, or hydroelectric have a better safety record. Nuclear plants are virtually pollution-free. But perhaps their biggest attractive feature is fuel economy. Only a hydroelectric power plant has a clear cut lead on fuel cost, but they are restricted geographically to sufficient waterways that support them. These reasons, and many more, make nuclear reactors technically attractive as an energy source. It is the purpose of this paper to summarize some basic reactor physics along with a simple description of different reactor types and their designs. This will yield some insight as to the technology and feasibility of nuclear reactors as power generators without imposing too much technical detail. When the facts are weighed against preconceived notions, nuclear energy is seen in a more favorable perspective.

536,604
DE85780145/GAR PC A07/MF A01
Ministerie van Economische Zaken, The Hague (Netherlands). Commissie Bestaande Kerncentrales.
Report of the Committee Existing Nuclear Power Plants.
12 Jan 83, 150p INIS-mf-9086
In Dutch.
U.S. Sales Only.

This report embodies the findings of the Committee 'Existing Nuclear Power Plants' of the Dutch Department of Economic Affairs. The terms of reference comprised an actual analysis of several aspects of the Netherlands' nuclear power. Two options are studied: (1) permanent and (2) temporary shutdown of the existing plants. As a substitute, only electric power generation using coal is considered. Subsequently, the committee deals with legal aspects; financial-economical aspects; employment, energy policy, security risks; environmental aspects; international and political aspects. (Atomindex citation 15:062215)

536,605
DE85780489/GAR PC A07/MF A01
Minas Gerais Univ., Belo Horizonte (Brazil). Curso de Pos-graduacao em Ciencias e Tecnicas Nucleares.
Development of a System for Data Collection and Processing by Telemetry.
Tese (M.Sc.),
R. F. Tavares Filho. 1983, 126p INIS-BR-191
In Portuguese.
U.S. Sales Only.

The environmental impact of nuclear industry is, obviously, a matter of the greatest concern. On account of that, a large number of parameters must be recorded during long periods with a high level of confidence. The site selection of Brazilian nuclear power plants is conducted under this philosophy. Data acquisition of ocean related parameters in remote, non explored, areas is rather stringent. In order to avoid a series of problems with data collection and processing, a telemetric system concept was developed. Electronic aspects of this system are, mainly, emphasized. For such purpose the system is split into two sub-systems: the former for data collection, signal conditionning and transmission and the latter for signal reception and treatment. All parts of the systems were tested in the laboratory before an integrated check, the corresponding results being encouraging. The whole equipment was installed one year ago at the sea shore region of Peruibe, state of Sao Paulo, and has been in operation, adequately, ever since. (Atomindex citation 15:073227)

536,606
DE85780795/GAR PC A06/MF A01
Ceskoslovenska Komise pro Atomovou Energii, Prague.
Nuclear Power Experience.
1983, 109p INIS-mf-9474, CONF-8303182-
In Czech.Nuclear power experience conference, Prague, Czechoslovakia, 22 Mar 1983.
U.S. Sales Only.

Individual items within the Energy Data Base scope were processed. (ERA citation 10:020747)

18F. Radiation Shielding and Protection

536,607
DE85008236/GAR PC A03/MF A01
Sandia National Labs., Albuquerque, NM.
Structural Code Benchmarking for the Analysis of Impact Response of Nuclear Material Shipping Casks.
R. E. Glass. Mar 85, 40p SAND-84-1855C
Contract AC04-76DP00789

The Transportation Technology Center at Sandia National Laboratories has initiated a program to benchmark thermal and structural codes that are available to the nuclear material transportation community. The program consists of the following five phases: (1) code inventory and review, (2) development of a cask-like set of problems, (3) multiple independent numerical analyses of the problems, (4) transfer of information, and (5) performance of experiments to obtain data for comparison with the numerical analyses. This paper will summarize the results obtained by the independent numerical analyses. The analyses indicate the variability that can be expected both due to differences in user-controlled parameters and from code-to-code differences. The results show that in purely elastic analyses, differences can be attributed to user controlled parameters. Model problems involving elastic/plastic material behavior and large deformations, however, have greater variability with significant differences reported for implicit and explicit integration schemes in finite element programs. This variability demonstrates the need to obtain experimental data to properly benchmark codes utilizing elastic/plastic material models and large deformation capability. (ERA citation 10:022980)

536,608
DE85008905/GAR PC A03/MF A01
Rockwell International, Golden, CO. Rocky Flats Plant.
Remote Engineering Progress Report, January-December 1983.
C. M. Brown. 22 Feb 85, 44p RFP-3694
Contract AC04-76DP03533

Progress in the Remote Engineering group's work at Rocky Flats from January to December 1983 is summarized. Remote Engineering's goals in all 1983 projects were to help increase production capacity and reduce radiation exposure by converting hands-on operations to remote operations. Seventeen separate projects were handled by Remote Engineering in 1983. Four of the projects automate related operations in Building 559, the Chemical Analytical Laboratory. In Building 559, the following operations needed mechanizing: Plutonium Oxide Pelletizing; Sample Cutting; Storage, Transfer, and Retrieval; and Emission Spectrometer. The majority of Remote Engineering's work concerned remoting diverse systems for production application. These systems included the Molten Salt Button Breakout Operation, Part Serialization processes for three buildings, Radiography, Americium Recovery, Photosensitive Liquid Coating Device, Part Brushing, Plutonium Oxide/Skull Burn and Reburn, the W-79 Remote Assembly Machine, Site Return Compactor, Filter Probe Positioner, and a Unimate Robot to replace the obsolete robot in the Building 883 Forging operation. The group provided mechanical engineering support to the 371 Task Team, and at the request of Lawrence Livermore Laboratory, the group evaluated an automated assembly for a Mechanical Safe and Arm Detonator (MSAD). Three of the projects were completed during the year including the Site Return Compactor, Photosensitive Liquid Coating Device and the MSAD demonstration. Two other systems are in production but still undergoing development: the W-79 Assembler and the PuO sub 2 Pelletizer. Three systems have been designed and fabricated and await final installation: the Emission Spectrometer Automation, the Filter Probe Positioner, and the Unimate Robot Replacement. The other projects are at various stages of design and development. (ERA citation 10:022978)

536,609
DE85009335/GAR PC A02/MF A01
Sandia National Labs., Albuquerque, NM.
Development of the Beneficial Uses Shipping System Cask.
H. R. Yoshimura, G. W. Wellman, J. L. Moya, A. Gonzales, and K. W. Gwinn. 1985, 8p SAND-84-2001C, CONF-850314-33
Contract AC04-76DP00789
Waste management '85, Tucson, AZ, USA, 24 Mar 1985.
Portions of this document are illegible in microfiche products.

The Beneficial Uses Shipping System (BUSS) cask is a Type B packaging currently under development at Sandia National Laboratories for the US Department of Energy (DOE) in their Beneficial Uses of Nuclear Waste Program. The cask will transport radioactive source capsules (CsCl and SrF sub 2) to facilities such as sewage and food irradiators. The principal design criteria for developing the BUSS cask are specified in 10CFR71. Extensive three-dimensional modeling and numerical analyses were performed to predict the effects of the impact, puncture, and fire accident conditions specified in the regulations. The cask prototype is being fabricated, and a Certificate of Compliance is being obtained. 16 references, 7 figures, 7 tables. (ERA citation 10:022412)

536,610
DE85009339/GAR PC A02/MF A01
Sandia National Labs., Albuquerque, NM.
Nuclear Waste Transportation System: Cask Interface and Physical Performance Specifications.
T. L. Sanders, G. C. Allen, and E. K. Opperman. 1985, 6p SAND-84-2039C, CONF-850314-32
Contract AC04-76DP00789
Waste management '85, Tucson, AZ, USA, 24 Mar 1985.

This paper describes the current status and strategy for the development of civilian nuclear waste transportation cask interface and physical performance specifications. These specifications are required to support the development and evaluation of future transportation packages that will convey commercial spent fuel and other waste forms to government storage and dis-

posal facilities in the late 1990's. 2 references, 2 figures. (ERA citation 10:022413)

536,611
DE85700415/GAR PC **A02**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Theoretical Physics Div.
Note on the Crack Incidence Function for Use in Probabilistic Failure Calculations for PWR Vessels.
A. B. Lidiard. Jul 84, 5p AERE-M-3402
U.S. Sales Only.

This note summarizes the arguments leading to the crack incidence function, A(x), which has been employed in several probabilistic calculations of the integrity of P.W.R. pressure vessels. (Atomindex citation 16:003072)

536,612
DE85700544/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Theory of Neutron Scattering in Disordered Alloys.
M. Yussouff, and A. Mookerjee. Aug 84, 25p IC-84/135
U.S. Sales Only.

A comprehensive theory of thermal neutron scattering in disordered alloys is presented here. We consider in detail the case of substitutional random binary alloy with random changes in mass and force constants; and for all values of the concentration. The cluster CPA formalism in augmented space developed here is free from analytical difficulties for the Green function, performs correct averaging over random atomic scattering lengths and employs a self-consistent medium for the calculations. For easy computation, we describe the graphical representation of the resolvent where the approximation steps can be depicted as closed paths in augmented space. Our results for scattering cross sections, both coherent and incoherent, include new types of terms and these lead to asymmetric line shapes for the coherent scattering. (Atomindex citation 16:008969)

536,613
DE85700545/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Pade Approximant Calculations for Neutron Escape Probability.
S. A. El Wakil, E. A. Saad, and A. A. Hendi. Jul 84, 10p IC-84/91
U.S. Sales Only.

The neutron escape probability from a non-multiplying slab containing internal source is defined in terms of a functional relation for the scattering function for the diffuse reflection problem. The Pade approximant technique is used to get numerical results which compare with exact results. (Atomindex citation 16:008970)

536,614
DE85750725/GAR PC **A10**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Abt. Sicherheit und Strahlenschutz.
Progress Report 1983 of the Abteilung fuer Sicherheit und Strahlenschutz (ASS).
R. Hille. Apr 84, 220p KFA-ASS-0397
In German.
U.S. Sales Only.

The Department for Safety and Radiation Protection (Abteilung Sicherheit und Strahlenschutz - ASS) is responsible for implementing all tasks in the safety sector, insofar as they are not performed by the following chain of responsibility: Board of Directors - senior official or radiation protection commissioner (Strahlenschutzverantwortlicher - SSV) - radiation protection officer (Strahlenschutzbeauftragter - SSB). This includes technical and organizational tasks in the fields of radiation protection, environmental protection, industrial safety and physical protection. The implementation of licensing procedures and the preparation of emergency protection measures are also among the activities of the Department. The present report gives a survey on ASS activities in the past year. (ERA citation 10:015357)

536,615
DE85780531/GAR PC **A02**/MF **A01**
Atomic Energy Control Board, Ottawa (Ontario). Advisory Committee on Nuclear Safety.
Proposed Statement on Safety Objectives for Nuclear Activities in Canada.
Jun 81, 7p INFO-0055(F), CCSN-2
In French.
U.S. Sales Only.

This report by the Advisory Committee on Nuclear Safety presents a concise statement of the basic safety objectives which the Committee considers underlie, or should underlie, the regulations and the licensing and compliance practices of the Atomic Energy Control Board. The report also includes a number of general criteria for achieving these objectives. (Atomindex citation 15:062266)

536,616
NUREG/CR-4031-V2/GAR PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Neutron Spectral Characterization for the Fifth Heavy Section Steel Technology (HSST) Irradiation Series, Neutronics Calculations,
F. B. K. Kam, M. L. Williams, and I. Remec. May 85, 43p ORNL/TM-9423/V2
Contract DE-AC05-84OR21400
See also NUREG/CR-4031-V3. Prepared in cooperation with Louisiana State Univ., Baton Rouge.

A series of calculations has been completed to compute dosimeter activation in the Oak Ridge Research Reactor (ORR) HSST Simulator Experiment. A comparison of calculated and experimental results shows that calculations underpredict dosimeter activities on the average of about 15%. The C/E values indicated the now familiar tendency to become lower as more iron is penetrated. The calculations also show shifted axial distribution relative to the measurements: the C/E values near the bottom of the core are about 15% to 20% higher than those near the top. This is probably due to a discrepancy in the axial power distribution computed with VIPOR/VENTURE.

536,617
NUREG/CR-4031-V3/GAR PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Neutron Spectral Characterization for the Fifth Heavy Section Steel Technology (HSST) Irradiation Series, Neutronics Exposure Parameters,
I. Remec, F. W. Stallmann, and F. B. K. Kam. Mar 85, 29p ORNL/TM-9423/V3
Contract DE-AC05-84OR21400
See also NUREG/CR-4031-V2.

This is the third volume of a three-volume report which describes the simulator experiments of the fifth series of HSST irradiation experiments which are sponsored by the U.S. Nuclear Regulatory Commission (NRC). The purpose of these three volumes is to document, in detail, the experimental and calculational methodology which will be used in determining the neutron-exposure parameters for the fifth and subsequent series of HSST irradiation experiments at ORNL. The methodology was also used in the fourth series of HSST irradiation experiments and represents the current state-of-the-art procedures developed in the Light Water Reactor Pressure Vessel Simulation Project which is a part of NRC's Surveillance Dosimetry Improvement Program. In this volume, the best estimates for the values and spatial distribution of fluence rate and displacements per atom per second are determined.

536,618
PB85-195212/GAR PC **E04**/MF **E04**
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
BUTRAN: A Multirod Code for Studying Core Uncovery Transients,
I. Shepherd. c1984, 57p EUR-9262-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The computer code BUTRAN is described. This is a fast running computer code designed to study boildown transients in bundles of fuel pins under accident conditions. The effects of rod to rod and rod to vapor thermal radiation are considered. During the heat up phase of the accident the zircalloy cladding reacts chemically with the steam coolant. The heat and the hydrogen produced by this reaction are calculated and the effect of the hydrogen concentration considered. Input instructions for BUTRAN are given together with two sample test cases to enable a user to set up an input deck.

18G. Radioactive Wastes and Fission Products

536,619
DE84013531/GAR PC**$41.00**/MF **A01**
Department of Energy, Oak Ridge, TN. Office of Scientific and Technical Information.
Radioactive Waste Processing and Disposal: A Bibliography. Part 1. Abstracts; Part 2. Indexes.
L. H. McLaren. Mar 85, 572p DOE/TIC-3311-S13-Pts.1and2

This compilation contains 4567 citations to foreign and domestic research reports, journal articles, patents, conference proceedings, and books dealing with radioactive waste management. These citations were added to the DOE Energy Data Base from January 1983 through December 1983. Five indexes are included: Corporate Author, Personal Author, Subject, Contract Number, and Report Number. (ERA citation 10:022455)

536,620
DE85003659/GAR PC **A03**/MF **A01**
Florida Univ., Gainesville. Dept. of Materials Science and Engineering.
Leaching Behavior of Nuclear Waste Glass Heterogeneities.
B. F. Zhu, D. E. Clark, L. L. Hench, and G. G. Wicks. 1985, 26p DP-MS-84-122, CONF-850536-1
Contract AC09-76SR00001
American Ceramic Society annual meeting, Cincinnati, OH, USA, 5 May 1985.
Portions of this document are illegible in microfiche products.

The results of a six-month burial experiment in granite are discussed. An alkali borosilicate simulated nuclear waste glass was buried in 3 exp - m boreholes at the 345 exp - m level in the Stripa mine. Some glass specimens containing crystallites exhibit preferential attack of the interface between crystalline and glassy phases. The crystalline phase, identified as spinel solid solution, exhibits better chemical resistance than the glassy phase. Results obtained from homogeneous and heterogeneous glasses (i.e., those containing a crystalline phase) are compared. 23 references, 7 figures, 2 tables. (ERA citation 10:022425)

536,621
DE85005860/GAR PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Flow Measurement and Control in the Defense Waste Process.
F. M. Heckendorn. 1985, 14p DP-MS-84-127, CONF-850582-1
Contract AC09-76SR00001
31. ISA international instrumentation symposium, San Diego, CA, USA, 6 May 1985.
Portions of this document are illegible in microfiche products.

The Defense Waste Processing Facility (DWPF) for immobilizing Savannah River Plant (SRP) high-level radioactive waste is now under construction. Previously stored waste is retrieved and processed into a glass matrix for permanent storage. The equipment operates in an entirely remote environment for both processing and maintenance due to the highly radioactive nature of the waste. A fine powdered glass frit is mixed with the waste prior to its introduction as a slurry into an electric glass furnace. The slurry is Bingham plastic in nature and of high viscosity. This combination of factors has created significant problems in flow measurement and control. Specialized pieces of equipment have been demonstrated that will function properly in a highly abrasive environment while receiving no maintenance during their lifetime. Included are flow meters, flow control technology, flow switching, and remote connections. No plastics or elastomers are allowed in contact with fluids and all electronic components are mounted remotely. Both two- and three-way valves are used. Maintenance is by crane replacement of process sections, utilizing specialized connectors. All portions of the above are now operating full scale (radioactively cold) at the test facility at SRP. 4 references, 8 figures. (ERA citation 10:022426)

536,622
DE85006285/GAR PC **A08**/MF **A01**
Battelle Project Management Div., Columbus, OH. Office of Nuclear Waste Isolation.

Identification of Sites within the Palo Duro Basin. Volume 2. Palo Duro Location B.
Nov 84, 171p DOE/CH-10(2)
Contract AC02-83CH10140
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

This three-volume document narrows to two sites for continued investigations for potential nuclear waste repository sites in the Palo Duro Basin of the Texas Panhandle. Volume 1 narrows a site previously identified in Deaf Smith County, Texas; Volume 2 narrows a site previously identified in Swisher County, Texas; and Volume 3 contains responses to comments received regarding the drafts of Volumes 1 and 2 (BMI/ONWI-531). These volumes discuss the methodology and logic used as well as the results that narrowed these sites. Each of the 10 site performance criteria was divided into descriptors related to site performance characteristics. Each descriptor was evaluated by a systematic logic to determine if it could be used as a discriminator. Then more- and less-preferred areas for groups of discriminators were defined and composite maps were prepared and evaluated to identify the sites. (ERA citation 10:022423)

536,623
DE85006324/GAR PC$11.25/MF **A01**
Department of Energy, Oak Ridge, TN. Office of Scientific and Technical Information.
Radioactive Waste Management: A Series of Bibliographies. Transuranic Wastes. Supplement 1.
L. H. McLaren. Apr 85, 132p DOE/TIC-3390-Sup.1

This bibliography contains information on transuranic waste included in the Department of Energy's Energy Data Base from August 1982 through December 1983. The abstracts are grouped by subject category as shown in the table of contents. Entries in the subject index also facilitate access by subject, e.g., Alpha-Bearing Wastes/Packaging. Within each category the arrangement is by report number for reports, followed by nonreports in reverse chronological order. These citations are to research reports, journal articles, books, patents, theses, and conference papers from worldwide sources. Five indexes, each preceded by a brief description, are provided: Corporate Author, Personal Author, Subject, Contract Number, and Report Number. (ERA citation 10:019964)

536,624
DE85008041/GAR PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Technology Assessment for INEL Buried TRU Waste Management Alternatives.
K. A. Henjum, E. J. Hallinan, and P. D. Hendrickson. Feb 85, 26p EGG-EA-6797
Contract AC07-76ID01570

The leave-as-is option is used at present for buried TRU waste at the INEL. The environmental monitoring program and subsurface migration studies will help to determine the adequacy of this alternative as a long-term management method. In any case, no new technology is contemplated, other than the gradual upgrading in monitoring and maintenance procedures and the SDA stabilization project as long as institution control of the INEL is maintained by the DOE. Improved confinement methods such as engineered barriers, grouting, and in situ vitrification, have been tested at other locations. The two latter methods will be demonstrated at the INEL. These methods are still developing and have not yet been tested at full scale. Subsurface mapping, to pinpoint waste locations, is a developing technology which would be useful in both improved confinement and retrieval operations. Ground-penetrating radar and magnetometry are two mapping techniques. The equipment, buildings, and personnel protection required for retrieval operations are available commercially and will need little or no modification for retrieval purposes. The Stored Waste Examination Pilot Plant (SWEPP) is designed to demonstrate the effectiveness of the certification, nondestructive examination, and TRU assay processes on stored TRU waste. SWEPP will be operable by the end of FY-1985. Minor technology development is expected to be needed for SWEPP to certify buried waste after retrieval and soil separation. Stored TRU waste processing at the Process Experimental Pilot Plant (PREPP) is scheduled to begin in FY-1987. Some modifications in the design of the plant would be necessary prior to processing buried TRU waste. Soil-immobilization processes are fully developed in other industries. These methods need to be tested on INEL soil to determine the most effective process. Soil-decontamination methods are still developing. (ERA citation 10:022432)

536,625
DE85008931/GAR PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Petite Sismique Measurements at the Spent Fuel Test - Climax.
J. J. Zucca. Sep 84, 28p UCRL-53597
Contract W-7405-ENG-48

In May 1984, a petite sismique estimate of the deformation modulus (E) was carried out at the Spent Fuel Test - Climax (SFT-C) at the Nevada Test site. The first part of the experiment was to repeat an earlier suite of measurements that were taken before the spent fuel was emplaced to see if any changes had resulted from heating the rock mass. The results of this measurement indicate a decrease in the modulus. However, these results are suspect in view of the findings in the second part of the experiment, which was designed to minimize the effects due to spurious resonances in the source and geophone locations. These effects were thought to bias the earlier measurements. The measurements indicate that the rock acts as a low-pass filter to the propagating wavefield. Furthermore, it is noted that the blow from a hammer is not a purely impulsive source. Therefore, depending on the type of source used and the distance away from the source, a different peak frequency and, hence, E could be measured for the same rock mass. Unless these effects are somehow factored out of a petite sismique survey, the value of E obtained could be severely biased. 20 figures. (ERA citation 10:023182)

536,626
DE85009020/GAR PC **A03**/MF **A01**
Geological Survey, Albuquerque, NM.
Geologic and Well-Construction Data for the H-10 Borehole Complex Near the Proposed Waste Isolation Pilot Plant Site, Southeastern New Mexico.
J. G. Wells, and S. L. Drellack. 1983, 44p USGS/WRI-83-4124

The H-10 borehole complex, a group of three closely spaced boreholes, is located 4 miles southeast of the proposed Waste Isolation Pilot Plant site in west-central Lea County, New Mexico. The holes were drilled during August and October 1979 to obtain geologic and hydrologic data to better define the regional ground-water-flow system. The geologic data presented in this report are part of a site-characterization study for the possible storage of defense-associated radioactive wastes within salt beds of the Salado Formation of Permian age. The geologic data include detailed descriptions of cores, cuttings, and geophysical logs. Each borehole was designed to penetrate a distinct water-bearing zone: H-10a (total depth 1318 feet) was completed just below the Magenta Dolomite Member of the Rustler Formation of Permian age; H-10b (total depth 1398 feet) was completed just below the Culebra Dolomite Member of the Rustler Formation; and H-10c (total depth 1538 feet) was completed below the Rustler Formation-Salado Formation contact. The geologic units penetrated in borehole H-10c are surficial alluvium and eolian sand of Holocene age (0 to 5 feet); the Mescalero caliche (5 to 9 feet) and the Gatuna Formation (9 to 90 feet) of Pleistocene age: formations in the Dockum Group (Chinle Formation, 90 to 482 feet and Santa Rosa Sandstone, 482 to 658 feet) of Late Triassic age; and the Dewey Lake Red Beds (658 to 1204 feet), the Rustler Formation (1204 to 1501 feet), and part of the Salado Formation (1501 to 1538 feet), all of Permian age. The sections of the Rustler and Salado Formations penetrated by borehole H-10c are complete and contain little or no evidence of dissolution of halite and associated rocks, indicating that the eastward-moving dissolution within the Rustler or on top of the Salado, found west of the Waste Isolation Pilot Plant site, has not reached the H-10 site. (ERA citation 10:022464)

536,627
DE85009524/GAR PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Hydrofracture Operations at Oak Ridge National Laboratory.
L. C. Lasher. 1985, 10p CONF-850314-31
Contract AC05-84OR21400
Waste management '85, Tucson, AZ, USA, 24 Mar 1985.
Portions of this document are illegible in microfiche products.

The hydrofracture process (shale fracture) was developed at ORNL for the purpose of disposing of the liquid low-level radioactive waste (LLW) solutions which are generated by the research and development activities conducted at this facility. The LLW is an alkaline solution (pH approx. = 10) which normally contains from 0.5 to 1.5 Ci of radioactivity per gallon. The major active constituents are exp 60 Co, exp 137 Cs, and exp 90 Sr. A pilot plant constructed in 1964 was used to develop operating techniques and evaluate equipment components. After seven successful experimental injections, this facility was converted into an operating disposal plant and was utilized in this manner from 1966 to 1980 when it was retired from service. Construction of the present disposal plant began in 1979 and was completed in October 1981. Training and shakedown operations were conducted early in 1982, and the first injection at the new site was completed in June of that year. In December 1982, after four injections had been completed, the well was inadvertently cemented in while preparing it for a sand slotting operation. A three-month recovery operation ensued. Operation of the New Hydrofracture Facility (NHF) was resumed in early April 1983, and ten injections consisting of LLW and slurried contaminated sludge have been completed without a major incident. 7 references, 9 figures, 5 tables. (ERA citation 10:022419)

536,628
DE85009570/GAR PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Equilibrium Sorption of Cobalt, Cesium, and Strontium on Bandelier Tuff: Analysis of Alternative Mathematical Modeling.
W. L. Polzer, H. R. Fuentes, E. H. Essington, and F. R. Roensch. 1985, 8p LA-UR-85-785, CONF-850314-41
Contract W-7405-ENG-36
Waste management '85, Tucson, AZ, USA, 24 Mar 1985.
Portions of this document are illegible in microfiche products.

Sorption isotherms are derived from batch equilibrium data for cobalt, cesium and strontium on Bandelier Tuff. Experiments were conducted at an average temperature of 23 exp 0 C and equilibrium was defined at 48 hours. The solute concentrations ranged from 0 to 500 mg/L. The radioactive isotopes exp 60 Co, exp 137 Cs, and exp 85 Sr were used to trace the sorption of the stable solutes. The Linear, Langmuir, Freundlich and a Modified Freundlich isotherm equations are evaluated. The Modified Freundlich isotherm equation is validated as a preferred general mathematical tool for representing the sorption of the three solutes. The empirical constants derived from the Modified Freundlich isotherm equation indicate that under dynamic flow conditions strontium will move most rapidly and cobalt least rapidly. On the other hand, chemical dispersion will be greatest for cesium and least for strontium. Hill Plots of the sorption data suggest that in the region of low saturation sorption of all three solutes is impeded by interactions among sorption sites; cobalt exhibits the greatest effect of interactions and strontium shows only a minimal effect. In the saturation region of 50% or more, sorption of cobalt is enhanced slightly by interactions among sorption sites whereas sorption of cesium and strontium appears to be independent of site interactions. 9 references, 4 figures, 2 tables. (ERA citation 10:022439)

536,629
DE85009808/GAR PC **A09**/MF **A01**
Stone and Webster Engineering Corp., Boston, MA.
Hydrogeologic Investigations Based on Drill-Stem Test Data: Palo Duro Basin Area, Texas and New Mexico.
E. S. Bair, T. P. O'Donnell, and L. W. Picking. Feb 85, 184p BMI/ONWI-566
Contract AC02-83CH10140
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Drill-stem test (DST) data were compiled from wildcat wells and DOE-sponsored wells in the Palo Duro Basin area of Texas and New Mexico. The data were used to construct pressure-depth diagrams and to map regional potentiometric surfaces, based on equivalent freshwater heads calculated from initial shut-in pressures of the Wolfcamp and Pennsylvanian brine aquifers, the two regionally important deep-basin aquifers downgradient of the proposed repository host rock. Eighty per-

cent of the 5502 DSTs were screened from the data base containing DST data from various deep-basin geologic units because they did not comply with shut-in time and shut-in pressure agreement criteria. After screening, three sets of pressure-depth diagrams and potentiometric surfaces were constructed, corresponding to three levels of data refinement. These results indicate the possible need for more data from an areally extended study area. (ERA citation 10:022417)

536,630
DE85700299/GAR PC **A02/MF A01**
Swedish Nuclear Fuel Supply Co., Stockholm. Div. KBS.
Movement of Radionuclides past a Redox Front.
I. Neretnieks, and B. Aaslund. Apr 83, 19p SKBF-KBS-TR-83-66
U.S. Sales Only.

It is assumed that radiolysis of water in a penetrated canister containing spent fuel has occured. Radionuclides and oxidizing agents are diffusing from the corroded canister and out through the clay barrier. A concentration front of radionuclides as well as of oxidizing agents is developed in the water that is flowing past the repository. The front propagates in a plane fissure with infinite extension. In the undisturbed bedrock reducing conditions normally prevail. The oxidizing agents are consumed by oxidation of the reducing components of the bedrock (primarily Fe(II)), and an oxidized region is developed. A redox front develops between the oxidizing and reducing regions. Some of the nuclides are much more soluble in an oxidizing environment than in a reducing. These nuclides will precipitate when they reach the redox front. The redox front moves much slower than the nuclides and can be assumed to be stationary at every moment. The movement of radionuclides in the flowing water up to and past the redox front have been computed. In the computations the transverse diffusion and precipitation at the redox front are accounted for. That part of the nuclides wich is not precipitated at the passage of the redox front has been computed for different solubility ratios and at various distances downstream from the canister. The solubility ratio indicates the solubility of a nuclide in a reducing environment divided by the solubility in an oxidizing environment. (Atomindex citation 15:069757)

536,631
DE85700370/GAR PC **A04/MF A01**
Svensk Kaernbraensleforsoerjning A.B., Stockholm.
KBS UO Sub 2 Leaching Program. Summary Report 1983-02-01.
R. Forsyth. Feb 83, 63p SKBF-KBS-TR-83-26, STUDSVIK-NF(P)-83-11
U.S. Sales Only.

The results so far obtained in the current KBS program on the leaching/corrosion of spent UO sub 2 fuel are presented and discussed. Fuel with a burnup of about 40 MWd/kgU from a fuel rod from the Oskarshamn I BWR is used as source material. Experiments have been performed mainly under oxidizing conditions, results being obtained which are in broad agreement with previously published work. An interesting feature of the experiments is the determination of the colloidal fraction of the material present in the aqueous phase after contact with the leachant. Such information, together with results of leaching at lower pH values, leads to the hypothesis that the concentrations of uranium and the activities in the aqueous phase are limited by solubility/adsorption effects. A number of experiments have also been performed where preliminary attempts to impose the more realistic reducing conditions on the system have been made. Here, a small but significant reduction in the apparent leach rates has been achieved. (Atomindex citation 16:001643)

536,632
DE85750290/GAR PC **A05/MF A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Storage Characteristics of Spent HTR Fuel Elements in Transport and Storage Containers of Modular Cast Iron.
R. Duwe, and H. Mueller. May 84, 86p Juel-Spez-254
In German.
U.S. Sales Only.

For performance of the measuring programme the CASTOR-AVR container designed by GNS and the TN-AVR 2 container designed by TN have been used in order to gain operating experiences with the loading and unloading of the containers and well as with their maintenance. The temperature is measured as well as the release of activity 1) from the FE into the can noload volume, 2) from the cans into the container and 3) from the container to the outside. The gamma - and neutron dose rates are determined. (ERA citation 10:011108)

536,633
DE85750767/GAR PC **A06/MF A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie.
Formation of Stable Emulsions at Solvent-Extraction Processes During the Reprocessing of Spent Nuclear Fuel.
Diss,
G. Printz. Jul 84, 118p Juel-1935
In German.
U.S. Sales Only.

During the reprocessing of spent nuclear fuel by liquid-liquid-extraction the formation of crud and in consequence an interruption of work may occur in the system 30% TBP/dodecane/nitric acid. Chemical and physical backgrounds were studied in simplified systems. The most important results obtained are: It has been concluded from this study that the crud is caused by Zirconium-Phosphate (Zr sub 3 (PO sub 4) sub 4) which is in contradiction to the prevailing findings that the emulsive agency of Zirconium-Dibutylphosphate (Zr-DBP) was responsible for the crud formation; The crud formation is a result of the stabilization of the mixed phase by a dispersed solid matter; A tenside working of Dibutylphosphate and Monobutylphosphate was not proved and in addition to result "1" it was found that in systems with low acidity (<= 0,1 Mol/l HNO sub 3) the precipitation of thorium and iron with DBP and MBP are found to cause the crud formation. The physical properties of the precipitates e.g. surface area, density, the rate of dispersion and wetting characteristics are being investigated. (ERA citation 10:017966)

536,634
DE85780562/GAR PC **A05/MF A01**
Hahn-Meitner-Inst. fuer Kernforschung Berlin G.m.b.H. (Germany, F.R.). Projekt Sicherheitsstudien Entsorgung.
Safety Analysis of off-Air and off-Gas Systems in Reprocessing. Summarizing Interim Report. Pt. 2.
Mar 83, 98p INIS-mf-9186
In German.
U.S. Sales Only.

The release of radionuclides out of the reprocessing and the surface facilities for waste processing and interim storage including the out-plant transports as well as out of the geological ultimate storage site via waste moulds, mine shafts and roadways, and salt deposit are analyzed. The diffusion in the atmosphere of nuclides released above-ground with a direct effect upon man by external radiation exposure and inhalation, the diffusion inside the groundwater-bearing strata of nuclides released underground, as well as the transfer into the food chain (ingestion) of nuclides released under- and above-ground are also described. Furthermore, a safety analysis of the exhaust gas purification system for the calcination/vitrification of HLW in a ceramic melter as well as a model of an iodine absorption filter pathway and of a sand bed filter in the cell exhaust air pathway are presented. (Atomindex citation 15:066553)

536,635
DE85780564/GAR PC **A05/MF A01**
Hahn-Meitner-Inst. fuer Kernforschung Berlin G.m.b.H. (Germany, F.R.). Projekt Sicherheitsstudien Entsorgung.
Safety Analyses for Reprocessing and Waste Processing. Summarizing Interim Report. Pt. 1.
Mar 83, 94p INIS-mf-9189
In German.
U.S. Sales Only.

Presentation of an incident analysis of process steps of the RP, simplified considerations concerning safety, and safety analyses of the storage and solidification facilities of the RP. A release tree method is developed and tested. An incident analysis of process steps, the evaluation of the SRL-study and safety analyses of the storage and solidification facilities of the RP are performed in particular. (Atomindex citation 15:066558)

536,636
DE85780677/GAR PC **A05/MF A01**
Atominstitut der Oesterreichischen Univ., Vienna.
Laser Surveillance System for Spent Fuel Storage Pools.
Diplomarbeit (Dipl. Ing.),
W. Pfluegl. Jul 84, 81p INIS-mf-9469
In German.
U.S. Sales Only.

The laser surveillance system (LSS), a new optical safeguard system, is being developed as a possible supplementation or alternative to camera surveillance at spent fuel storage pools (SFSP). It is designed to act as a sheet of light covering the spent fuel assemblies in an SFSP. Its performance relies heavily on the proper design of the so-called emitter-detector optical assembly (EDOA), the 'eye' of the system. With the constructed prototype fuel assemblies could be detected up to a distance of 20 m in a tube filled with destilled water at the Atominstitut Wien, where measurements on various parameters of the LSS were performed. During a week of field tests at the Euratom Joint Research Center Ispra, Italy, the proof-of-principle was shown. (Atomindex citation 15:070579)

536,637
DE85780710/GAR PC **A05/MF A01**
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses (France).
Safety Analysis of LWR Irradiated Fuel Element Pool Storages Before Reprocessing.
G. Lefort, J. Leclerc, A. Hoffman, C. Frejaville, and M. Domage. Jan 84, 77p CEA-CONF-7211, CONF-830948-1, DAS--55
In French and English.Seminar on technical and environmental aspects of spent fuel management, Madrid, Spain, 26 Sep 1983.
U.S. Sales Only.

The protection of operators and environment requires imperatively that the safety must be taken into account as early as the design of the pools takes place and working conditions are defined. The analysis of criticality, irradiation, contamination, external or internal aggression hazards... allows to draw the main constraints which must be retained in the sizing of these pools: the criticality risk needs distances between fuel elements which results in a not very good utilization of the available area which leads to the utilization of neutron shieldings or requires a safe knowledge of the fuel elements burn up; the irradiation and contamination risks require a special quality of the pool water (temperature, activity, purity...) a good tightness of the basins to locate and to isolate the dubions fuel elements; the external or internal aggression risks such as earthquakes, missiles or loads drops, explosion, imply the civil engineering and involve the use of special technical devices. A brief presentation of the pool storages of the next UP2-800 and UP3 A reprocessing plants allows to show how the requirement drawn by safety analysis have been enforced, while carrying out civil engineering works without equivalent in the world, in this field. The foreseeable evolution of the uranium enrichment rate and burn-up of next PWR fuel elements have an effect upon the risk evaluations; a device apparatus, developed in CEA, for the measurement of burn up and cooling time is presented. At least, a short presentation of the mechanical structure durability studies of the reception and storage spent fuels installations are allowed to improve our knowledge in working conditions and in case of serious accidents. (ERA citation 10:012384)

536,638
DE85780729/GAR PC **A02/MF A01**
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses (France).
Spent Fuel Management in France.
B. Guillemard. Mar 84, 21p CEA-CONF-7246, CONF-8403160-1
IAEA expert meeting on spent fuel management, Vienna, Austria, 27 Mar 1984.
U.S. Sales Only.

Spent fuel management in France is characterized by the reprocessing option; reprocessing being one of the major nuclear fuel industries developed to keep pace with the upgrowth of the national nuclear power program based initially on light water reactors and, subsequently, on fast breeder reactors. During the last years many communications have been made in international conferences and many publications have been issued, most of them are indicated in the 33 references. The importance of reprocessing from the energy conservation standpoint, the advantage of re-

processing from the waste management and safety standpoints and the economic aspects are presented. (ERA citation 10:012345)

536,639
DE85901190/GAR **MF A01**
Notes on Incineration of Radioactive Waste.
L. M. Martin. 1984, 15p WINDSCALE-TRANS-994
Translated from Energ. Nucl. (Madrid); 28: No. 148, vp(Mar-Apr 1984).
U.S. Sales Only. Microfiche only, copy does not permit paper copy reproduction.

The problem of finding commercial sites for the disposal of low-level radioactive waste and temporary storage of residues containing transuranic elements has led to research on using a method to reduce the volume of the waste originating from nuclear installations. The following incineration processes are discussed: acid digestion process, controlled air incineration, fluid bed incineration, centrifugal incineration (cyclone), electrofusion, revolving furnace and simple kiln incineration, and pyrolysis of ashes. An appendix is included that deals with incineration of waste from biomedical institutions. 5 figures. (ERA citation 10:022456)

536,640
NUREG/CR-1755-ADD-1/GAR **PC A03/MF A01**
Battelle Pacific Northwest Labs., Richland, WA.
Technology, Safety and Costs of Decommissioning Nuclear Reactors at Multiple-Reactor Stations: Effects on Decommissioning of Interim Inability to Dispose of Wastes Offsite (Addendum 1),
E. B. Moore. Apr 85, 40p
See also NUREG/CR-1755.

The purpose of this addendum is to examine the impacts of an interim inability to carryout offsite disposal of radioactive wastes and spent fuel on the decommissioning of a multiple-reactor power station. The example selected for study is a four-PWR station in which each PWR is prepared for safe storage at two-year intervals, held in safe storage for 100 years, and then finally decommissioned by deferred dismantlement at two year intervals. BWRs are neglected for simplicity and in the expectation that the results would be similar to those for PWRs. Only SAFSTOR is considered because DECON and ENTOMB are unsuitable by definition for interim storage of radioactive wastes and/or spent fuel. It is assumed that all radioactive wastes and spent fuel are shipped offsite by the end of decommissioning.

536,641
NUREG/CR-4101/GAR **PC A99/MF A01**
Science Applications International Corp., Rockville, MD.
Assay of Long-Lived Radionuclides in Low-Level Wastes from Power Reactors.
Technical rept. Jun 82-Feb 85,
J. E. Cline, J. R. Noyce, L. J. Coe, and K. W. Wright. Apr 85, 617p

The 10 CFR Part 61 waste classification system includes several nuclides which are difficult to assay without expensive radiochemical methods. In order for waste generators to classify wastes practically, NRC Staff has recommended the use of correlation factors to scale the difficult-to-measure nuclides with nuclides which can be measured more easily (i.e., gamma emitters such as 60Co or 137Cs). In this study, Science Applications International Corporation (SAIC) performed complete radiochemical assays for all the 10 CFR Part 61 waste classification nuclides on over 100 samples. These data, along with almost 800 other samples in the SAIC data base, were used to assess the validity of correlation factors suggested for use for nuclear power plant wastes. Specific generic correlation factors are recommended with other approaches to correlate nuclides for which generic scaling factors are not defensible.

536,642
NUREG/CR-4114/GAR **PC A04/MF A01**
Oak Ridge National Lab., TN.
Valence Effects on the Sorption of Nuclides on Rocks and Minerals. 2,
R. E. Meyer, W. D. Arnold, and F. I. Case. Feb 85, 51p ORNL-6137
Contract DE-AC05-84OR21400
See also NUREG/CR-3389.

Estimation of the rates of migration of nuclides from nuclear waste repositories requires knowledge of the interaction of these nuclides with the components of the geological formations in the path of the migration. These interactions will be dependent upon the valence state and speciation of the nuclide. Experiments designed to measure interaction of multivalent nuclides and minerals must therefore include study of the speciation of the nuclides. An electrochemical method of valence state control and solvent extraction analyses of the valence states were used to study a number of reactions of interest to HLW repositories. These include the reduction of Np(V) and Tc(VII) by crushed basalt and other minerals. For the reduction of Np(V) by basalt, the experiments indicate that the sorption of basalt increases with pH and that most of the Np is reduced to Np(IV) which is very difficult to remove from the basalt even if oxygenated tracer-free solution is added to the solution. For the experiments with Tc(VII), the results are considerably more complicated. Experiments were initiated to determine the solubility of Tc(IV) oxides. The results of these experiments are used to assess some of the techniques and methods currently used in safety analyses of proposed HLW repositories.

536,643
PB85-186450/GAR **PC E05/MF E05**
Commission of the European Communities, Luxembourg.
Long-Term Storage of 85Kr in Amorphous Zeolite 5A.
Final rept.,
R. D. Penzhorn, H. Noppel, A. Dorea, K. Guenther, and H. Leitzig. c1984, 81p EUR-9106-EN, ISBN-92-825-4273-4
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Ar, Kr and Xe can be immobilized in type A zeolites as well as in mordenite and chabazite, when the original crystal structure is hydrothermally vitrified in the presence of the densified gas. Zeolites containing a high percentage of earth alkali metals yield encapsulates that are thermally very stable. Gas fixation conditions are essentially independent of the form of aggregation of the matrix. Noble gas encapsulates were characterized by their specific surface area as well as by microprobe analysis, X-ray analysis and electron diffraction. The results indicate that Kr is immobilized in units smaller than the size of a zeolite crystal. To verify the process, active samples having specific activities up to 30 mCi/g have been prepared. Leaching results demonstrate the chemical stability of the Kr/5A encapsulates. A semi-pilot facility based on the one-way autoclave concept has been constructed and demonstrated in operation.

536,644
PB85-195220/GAR **PC E04/MF E04**
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
LISA (Long Term Isolation Safety Assessment): A Code for Safety Assessment in Nuclear Waste Disposals Program Description and User Guide,
A. Saltelli, G. Bertozzi, and D. A. Stanners. c1984, 59p EUR-9306-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The code LISA (Long Term Isolation Safety Assessment), developed at the Joint Research Center, Ispra is a useful tool in the analysis of the hazard due to the disposal of nuclear waste in geological formations. The risk linked to preestablished release scenarios is assessed by the code in terms of dose rate to a maximum exposed individual. The various submodels in the code simulate the system of barriers--both natural and man made--which are interposed between the contaminants and man. After a description of the code features a guide for the user is supplied and then a test case is presented.

18H. Radioactivity

536,645
DE85750297/GAR **PC A04/MF A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Neutronenphysik und Reaktortechnik.
Frequency Distributions of Activity Concentrations after Accidential Releases of Radionuclides.
J. Ehrhardt, and U. Zoeller. Aug 84, 62p KFK-3770
In German.
U.S. Sales Only.

The increasing application of risk assessments for nuclear installations in decision making procedures also requires to analyse intermediate results of accident consequence calculations in detail. The activity concentrations to be expected are an important quantity especially to judge the effectiveness and feasibility of technical, administrative and medical emergency actions. For this reason, a modified version of the accident consequence code UFOMOD was developed, which allows to calculate frequency distributions of activity concentrations. In the report, graphical and numerical forms of presentation demonstrating the relationships between frequency, activity concentration, affected areas and the number of persons living there are described and discussed. This is done exemplarily using the results of accident consequence calculations for the nuclides I-131 and Cs-137 based on the release category FK2 of the "German Risk Study". (ERA citation 10:011165)

536,646
DE85760519/GAR **PC A15/MF A01**
Atomic Energy Control Board, Ottawa (Ontario).
Second Workshop on Radon and Radon Daughters in Urban Communities Associated with Uranium Mining and Processing.
1979, 343p AECB-1164, CONF-7903186-
Workshop on radon and radon daughters in urban communities associated with uranium mining and pr5ocessing, Bancroft, Ontario, Canada, 12 Mar 1979, Sponsored by the Atomic Energy Control Board under the aegis of the Federal-Provincial Task Force on Radioactivity.
U.S. Sales Only.

A second meeting of Atomic Energy Control Board staff, federal and provincial government representatives, and consultants was held to discuss progress in reducing the concentrations of radon and its daughter products in houses in communities like Bancroft, Elliot Lake, Port Hope, and Uranium City. Participants discussed successful and unsuccessful remedial techniques, possible sources of radon, and methods of measuring radon and radon daughters in buildings. (Atomindex citation 15:062094)

536,647
DE85780520/GAR **PC A18/MF A01**
Atomic Energy Control Board, Ottawa (Ontario).
Third Workshop on Radon and Radon Daughters in Urban Communities Associated with Uranium Mining and Processing. Pt. 1.
1980, 409p AECB-1164-3, CONF-8003203-Pt.1
Workshop on radon and radon daughters in urban communities associated with uranium mining and processing, Port Hope, Canada, 12 Mar 1980, Sponsored by the Atomic Energy Control Board under the aegis of the Federal-Provincial Task Force on Radioactivity.
U.S. Sales Only.

This third meeting of Atomic Energy Control Board staff, contractors, federal and provincial government representatives, and delegates from outside Canada was held to discuss progress in reducing concentrations of radon and radon daughters in houses. Speakers talked about successful and unsuccessful remedial measures, methods of measuring and monitoring thoron and radon in houses, and indoor radon concentrations in Canada, Britain and Sweden. (Atomindex citation 15:062095)

536,648
DE85780563/GAR **PC A05/MF A01**
Hahn-Meitner-Inst. fuer Kernforschung Berlin G.m.b.H. (Germany, F.R.). Projekt Sicherheitsstudien Entsorgung.
Calculation of Radionuclide Migration Via the Air and Food Pathway and of the Potential Radiation Exposure Resulting from Surface, Facilities for Nuclear Waste Management. Summartzing Interim Report. Pt. 4.
May 83, 92p INIS-mf-9188
In German.
U.S. Sales Only.

For a complete risk analysis the diffusion of the radionuclides in the air, on vegetation and ground must be

known even for the farther vicinity of the emission point. The diffusion is determined by the change of the meteorological conditions during the migration. To this effect the volume source model has been developed taking into account the variation with time of the wind direction, the wind velocity, the turbulence condition of the atmosphere and the precipitation. The atmospheric model takes into account the wash- and fallout thus forming an interface with the ecological models. (Atomindex citation 15:066557)

536,649
NUREG/CR-3455/GAR PC **A05**/MF **A01**
Westinghouse Idaho Nuclear Co., Inc., Idaho Falls.
Comparison of Iodine, Krypton, and Xenon Retention Efficiencies for Various Silver Loaded Adsorption Media.
Topical rept. Oct 84-Jun 85,
R. L. Huchton, J. W. Tkachyk, J. T. Taylor, and B. G. Motes. Mar 85, 81p WINCO-1024
Contract DE-AC07-84ID12435

A comparison was made among various silver impregnated adsorption media to determine their iodine, krypton, and xenon retention efficiencies. The program consisted of three components. First, laboratory measurements of the noble gas retention efficiencies of commercially available adsorption media were determined as a function of relative humidity, sample duration, test cartridge geometry, and ambient air purge. Second, a literature survey was performed to evaluate the iodine species retention efficiencies of the selected media. Third, data associated with a media previously proposed for an emergency response air sampler were incorporated to enlarge the data base.

536,650
PB85-186674/GAR PC **A04**/MF **A01**
Eastern Environmental Radiation Facility, Montgomery, AL.
Environmental Radiation Data, Report 39, July-September 1984.
G. A. Luster, J. W. Gunter, and C. M. Petko. Dec 84, 54p EPA/520/5-85/009
See also PB85-164838.

Environmental Radiation Data (ERD) is compiled and distributed quarterly, and contains data from the Environmental Radiation Ambient Monitoring System (ERAMS). Data from similar networks operated by contributing States, Canada, Mexico, and the Pan American Health Organization are reported in the ERD when available. ERAMS was established in 1973 by the U.S. Environmental Protection Agency's Office of Radiation Programs (ORP). The ERAMS is comprised of nationwide sampling stations that provide air, surface and drinking water, and milk samples from which environmental radiation levels are derived. The major emphasis for ERAMS is toward identifying trends in the accumulation of long-lived radionuclides in the environment. Sampling locations are selected to provide optimal population coverage while functioning to monitoring fallout from nuclear devices and other forms of radioactive contamination of the environment. The radiation analyses performed on these samples include gross alpha and gross beta levels, gamma analyses for fission products, and specific analyses for uranium, plutonium, strontium, iodine, radium, krypton, and tritium.

18I. Reactor Engineering and Operation

536,651
DE84703550/GAR PC **A06**/MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
System Description for ROSA-IV Two-Phase Flow Test Facility (TPTF).
H. Nakamura, M. Tanaka, K. Tasaka, Y. Koizumi, and H. Murata. Mar 83, 110p JAERI-M-83-042
U.S. Sales Only.

This report describes system of the Two-Phase Flow Test Facility (TPTF) and its instrumentation. The information is necessary to understand and analyze the separate-effect experimental data for light water reactors obtained from the TPTF thermohydraulic experiments under two-phase flow conditions at steady state. (Atomindex citation 15:059456)

536,652
DE85002774/GAR PC **A02**/MF **A01**
Argonne National Lab., IL.
Computational Model for Debris Bed Boiling and Dryout.
R. P. Stein. 1985, 4p CONF-850410-11
Contract W-31-109-ENG-38
ANS/ENS fast reactor safety meeting, Knoxville, TN, USA, 21 Apr 1985.

CONACS is an LMFBR safety related computer program being developed for DOE by HEDL (WHC). Its purpose is to provide a general code system for analyzing the long term consequences of hypothetical core disruptive accidents. Development of the program is divided into several segments. Contributions related to the formulation of mathematical models for the segment associated with the Reactor Cavity and its Basemat are being developed at ANL. During the course of this development a relatively simple computational model to account for debris bed heat transfer, including boiling and dryout, has been formulated and tested over wide ranges of likely initiating conditions. The formulation intentionally avoids the complications and uncertainties associated with the many phenomenological details which, it is believed, do not have a sufficiently adequate technological base to justify inclusion in a large safety related program such as CONACS. The computational model will be described; its use over wide ranges of initiation conditions illustrated; and arguments will be offered to support its applicability. (ERA citation 10:022670)

536,653
DE85008232/GAR PC **A04**/MF **A01**
General Electric Co., Schenectady, NY. Nuclear Systems Technology Operation.
Gas Carburization of Inconel 617. Advanced Gas Cooled Reactor Materials Program.
O. F. Kimball. Dec 84, 52p DOE/ET/34034-113
Contract AC03-80ET34034
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

This report describes the progress in the Advanced Gas Cooled Reactor Materials Program on efforts to produce uniformly carburized specimens of Inconel 617 with different carbon levels. This material will be used to determine the effect of carbon content on the mechanical properties and physical properties important for design and use of components in the primary circuit of an advanced HTGR system. The results of gas carburization and high temperature homogenization heat treatments are discussed. Also described are electron microprobe analysis methods for measuring the carbon gradients in the carburized and homogenized material. Recommendations are given for additional work needed to increase the homogeneity of carburized material and for producing material with uniform carbon concentration. Recommendations for improving the accuracy of the EPMA carbon gradient analyses also are included. (ERA citation 10:022639)

536,654
DE85008433/GAR PC **A02**/MF **A01**
UNC Nuclear Industries, Inc., Richland, WA.
Evaluation of a Kalman Filter Based Power Pressurizer Instrument Failure Detection System Implemented on a Nuclear Power Plant Training Simulator.
D. S. Seegmiller. 7 Dec 84, 4p UNI-SA-133, CONF-8503113-3
Contract AC06-76RL01857
Eastern simulation conference, Norfolk, VA, USA, 3 Mar 1985.
Portions of this document are illegible in microfiche products.

The usefulness of a nuclear power plant training simulator for developing and testing modern estimation and control applications for nuclear power plants is demonstrated. A Kalman filter based instrument failure detection technique for a pressurized water reactor pressurizer is implemented on the Department of Energy N Reactor Training Simulator. This real-time failure detection method computes the first two moments (mean and variance) of each element of a normalized filter innovations vector. Failed pressurizer instrumentation can be detected by comparing these moments to the known statistical properties of the steady state, linear Kalman fitler innovations sequence. The capabilities of the detection system are evaluated using simulated plant transients and instrument failures. (ERA citation 10:020529)

536,655
DE85700413/GAR PC **A02**/MF **A01**
Commission of the European Communities, Luxembourg.
1982 Annual Status Report: Reactor Safety.
1982, 12p EUR-8519
U.S. Sales Only.

This report presents the projects of the Reactor Safety Program at the JRC: 1) Reliability and risk evolution; 2) LWR loss of coolant accident studies; 3) Primary system integrity; 4) LMFBR core accident initiation and transition phase; and, 5) LMFBR accident post disassembly phase. (Atomindex citation 16:002958)

536,656
DE85700416/GAR PC **A05**/MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
Evaluation Report of CCTF Core-I Reflood Tests CI-2 (Run 11) and CI-11 (Run 20). Effect of the Installment of the Baffle Plates in the Control Rod Guide Tubes and the Spool Piece in the Primary Loops.
H. Akimoto, and Y. Murao. Jun 83, 98p JAERI-M-83-094
U.S. Sales Only.

The cylindrical core testing facility (CCTF) was modified in August, 1979, by inserting baffle plates into control rod guide tubes to simulate the guide of control rods and by installing instrumented spool pieces in primary piping to measure the transient of variables in two-phase flow. The test results of CI-2 performed before the modification and CI-11 after the modification were analyzed to check the effect of the modification on the thermal and hydraulic behavior of the CCTF. The conclusion of this study is summarized as follows. The installation of spool pieces in primary piping resulted in the increase of flow resistance by only about 4 %. No significant change was observed between the test CI-2 and CI-11 in the fluid temperature measured at an intact cold leg nozzle. The behavior of water accumulation in the upper plenum was affected by the installation of baffle plates in control rod guide tubes. The quench behavior from the top of the core was affected by the modification only in the central region of the core. Even though some effect was observed due to the modification, it was confirmed that the effect was localized in the vicinity of the modified parts, and the effect was reasonably small. (Atomindex citation 16:003095)

536,657
DE85750277/GAR PC **A03**/MF **A01**
Gesellschaft fuer Reaktorsicherheit m.b.H., Cologne (Germany, F.R.).
List of Reports on Reactor Safety Research of BMFT, CEA, EPRI, JSTA and USNRC.
Jul 84, 50p GRS-F-136
In German.
U.S. Sales Only.

This list reviews reports from the Federal Republic of Germany, from France, from Japan and from the United States of America concerning special problems in the field of reactor safety research. According to the cooperation of the Bundesminister fuer Forschung und Technologie (BMFT) with the Commissariat a l'Energie Atomique (CEA), the Japan Science and Technology Agency (JSTA), the Electric Power Research Institute (EPRI) and the United States Nuclear Regulatory Commission, these reports are available in the Gesellschaft fuer Reaktorsicherheit (GRS). The list pursues the following order: Country of origin, problem area concerned, according to the Reactor Safety Research Programm of the BMFT, reporting organization. The list of reports appears quarterly. Requests for reports should be addressed to GRS, Forschungsbetreuung. Contractual points of view have to be considered for the distribution of the reports. (ERA citation 10:011162)

536,658
DE85750298/GAR PC **A04**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Lab. fuer Aerosolphysik und Filtertechnik 1.
Parametric Investigations on the Retention of Methyl Iodide by a KI-Impregnated Activated Carbon.
H. Deuber, and K. Gerlach. Jun 84, 68p KFK-3746
In German.
U.S. Sales Only.

investigations are described on the retention of methyl iodide (CH sub 3 I-131) by a typical batch of the activated carbon 207B (KI) which is mostly used in the iodine filters of German nuclear power plants. The results obtained with variation of about ten parameters are relevant both for the testing of activated carbons and for the design, operation and surveillance of iodine filters. (ERA citation 10:011124)

536,659
DE85780330/GAR PC **A24/MF A01**
Technische Hochschule Aachen (Germany, F.R.). Fakultaet fuer Maschinenwesen.
Design of Reactor Internals in Larger High-Temperature Reactors with Spherical Fuel Elements.
Habil.Schr,
C. Eller. 14 Jul 81, 570p INIS-mf-8773
In German.
U.S. Sales Only.

In his paper, the author analyzes and summarizes the present state of the art with emphasis on the prototype reactor THTR 300 MWe, because in addition to spherical fuel elements, this type includes other features of future HTR design such as the same flow direction of coolant gas through the core. The paper on hand also elaborates design guidelines for reactor internals applicable with large HTR's of up to 1200 MWe. Proved designs will be altered so as to meet the special requirements of larger cores with spherical elements to be reloaded according to the OTTO principle. This paper is furthermore designed as a starting point for selective and swift development of reactor internals for large HTR's to be refuelled according to the OTTO principle. (Atomindex citation 15:036614)

536,660
DE85780454/GAR PC **A02/MF A01**
Centro de Desenvolvimento da Tecnologia Nuclear, Belo Horizonte (Brazil).
PANTERA-1P: A Computer Code for Thermohydraulic Analysis of Water Core Reactors.
M. A. Veloso. Dec 82, 13p NUCLEBRAS-CDTN-446/82
In Portuguese.
U.S. Sales Only.

A new computer code developed at Nuclebras, for the analyses by sub-channels of fuel rod bundles and nuclear reactor core, is described. (Atomindex citation 15:073023)

536,661
DE85780530/GAR PC **A02/MF A01**
Atomic Energy Control Board, Ottawa (Ontario). Advisory Committee on Nuclear Safety.
Recommendations on AECB (Atomic Energy Control Board, Canada) Draft Licensing Guides Nos. 40,41,42.
Jun 81, 7p INFO-0054(F), CCSN-1
In French.
U.S. Sales Only.

This report contains the recommendations of the Advisory Committee on Nuclear Safety (ACNS) to the Atomic Energy Control Board concerning the draft AECB Licensing Guides 40, 41 and 42 which were issued subsequently as Consultative Documents Nos. 7, 8 and 9. Since the report focusses on points of principle or generic concern, most of its recommendations apply generally to all three documents, although some specific recommendations are included. (Atomindex citation 15:062265)

536,662
DE85780537/GAR PC **A03/MF A01**
Atomic Energy of Canada Ltd., Ottawa (Ontario).
Annual Report, 1981-1982 (for Atomic Energy of Canada Ltd.).
1982, 31p AECL-7755
U.S. Sales Only.

Recent operational restructuring implemented grouped the Engineering, Chemical, and International Companies under CANDU Operations. The Research Company was charged with finding products and markets to bridge the gap in new orders for reactors apparent for the next few years. Net income rose 46 percent to $19.7 million. Economic slowdown in Canada and elsewhere had little effect as AECL continued to fulfill obligations on previously negotiated multi-year contracts. Over 60 percent of commercial revenue came from outside Canada, and at $234 million was marginally higher than 1980-81. Development of the superconducting cyclotron continued at Chalk River, with successful testing of magnetic field and radiofrequency systems. The nuclear fuel waste management program continued, with selection of a site for an underground research laboratory near Pinawa, Manitoba. The Therac-25 high energy accelerator for cancer therapy neared completion of its development and manufacturing program. There are more than 10 orders already booked. A record 15.2 million curies of cobalt 60 were shipped, an increase of 25 percent in orders for gamma irradiation processing. The prototype Douglas Point generating station was returned to full power and reached its highest annual capacity factor since 1975. Conceptual design of the new standardized two 950MW-unit CANDU PHWR generating station was completed. AECL responded to a request for quotations from the Mexican government for its nuclear power program. (Atomindex citation 15:062359)

536,663
DE85780553/GAR PC **A02/MF A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Analysis of the Core Characteristics and Slightly Enriched Uranium-Plutonium Fuel Cycle for the HTGR with Large Unit Power.
V. A. Karpov. 1983, 20p IAE-3729/4
In Russian.
U.S. Sales Only.

The effect of the fuel enrichment and fuel element U charge on the basic characteristics of the the high-temperature gas-cooled reactor (HTGR) core and its fuel cycle at the equilibrium burnups is investigated. The results of the parametric analysis of the basic neutron-physical and thermal hydraulic characteristics of the 1000 MW pebble bed HTGR core presented. The fuel elements are reloaded according to the once-through-then-out (OTTO) principle. The calculations are performed according to the GOTAR program for the ratio of the number of carbon nuclei to the number heavy of nuclei Nsub(c)/Nsub(HN)=200-600 and fuel enrichment of 6.5, 8.0 and 10.0%. The analysis of the data obtained shows that on a whole HTGR with Nsub(c)/Nsub(HN)=400 and the fresh fuel enrichment equal to 8%, have the most favourable characteristics. When using the radial breeding zones it is advisable to increase Nsub(c)/Nsub(HN) up to 500-600. The conclusion is drawn that from the viewpoint of natural Uranium requirements in case of using uranium-plutonium cycle, HTGR operating according to the OTTO principle are more saving as compared with the modern WWER. (Atomindex citation 15:064802)

536,664
DE85780554/GAR PC **A03/MF A01**
Japan Atomic Energy Research Inst., Tokyo.
Analytical Study on Seal Performance Between Graphite Blocks in the Experimental VHTR Core. The Effect of Single-Layer and Multi-Layer Seal Elements.
M. Fumizawa, K. Suzuki, and Y. Miyamoto. Jun 83, 40p JAERI-M-83-078
In Japanese.
U.S. Sales Only.

This report describes an analysis of seal performance between graphite blocks. The seal elements are provided on the blocks in order to reduce the leak flows which bypass main coolant flow path in the experimental VHTR core. The analysis clarified single- and multi-layer seal performance. The results are as follows: (1) The correlations of multi-layer seal performance can be expressed in the form K/A exp 2 = F(delta p,n) = G(Re,n) where K/A exp 2 is leak flow factor, delta p pressure difference, n the number of seal element layer and Re the Reynords number. (2) The gap at a seal element dsub(s) is obtained as a function of delta p, and n. The value of dsub(s) decreases with increasing delta p and with n. (3) When dsub(s) is less than 10 % of the gap between adjacent blocks, flow resistance through a seal element is dominant and it is greater than 96 % of total flow resistance. (Atomindex citation 15:064803)

536,665
DE85780555/GAR PC **A04/MF A01**
Japan Atomic Energy Research Inst., Tokyo.
Temperature Distribution Measurement in the Hot Gas Duct of HENDEL. Results of Tests, No. 1 Cycle and No. 2 Cycle Operations, (February 1982-October 1982).
K. Kunitomi, I. Ioka, K. Umenishi, M. Hishida, and T. Tanaka. Jun 83, 59p JAERI-M-83-082
U.S. Sales Only.

The HENDEL (Helium Engineering Demonstration Loop) which was completed on March, 1982, has been operated 3 times so far, including a test operation when it was handed over to JAERI. In the main part of HENDEL which is called a Mother + Adapter (M+A) loop, a hot gas duct through which helium gas of 1000 exp 0 C, 40 atm, 4kg/s flows is installed. This report deals with the measurement and evaluation of temperature distribution of the hot gas duct. The maximum surface temperature of the hot gas duct was 230 exp 0 C, which is low enough, compared with an allowable design temperature of 350 exp 0 C. The effective thermal conductivity of the insulation inside the hot gas duct was found to be 0.40 - 0.49 kcal/mh exp 0 C. (Atomindex citation 15:064804)

536,666
DE85780596/GAR PC **A07/MF A01**
Minas Gerais Univ., Belo Horizonte (Brazil). Curso de Pos-graduacao em Ciencias e Tecnicas Nucleares.
Seismic Instrumentation for Nuclear Power Plants.
Tese (M.Sc.),
M. Senne. Jul 83, 128p INIS-BR-176
In Portuguese.
U.S. Sales Only.

A seismic instrumentation system used in nuclear power plants to monitor the design parameters of systems, structures and components, needed to provide safety to those plants, against the action of earthquakes is described. The instrumentation is based on the nuclear standards and other components used, as well as their general localization is indicated. The operation of the instrumentation system as a whole and the handling of the recovered data are dealt with accordingly. The accelerometer is described in detail. (Atomindex citation 15:068410)

536,667
DE85780599/GAR PC **A06/MF A01**
Teldersstichting (B.M.), The Hague (Netherlands).
Nuclear Plants at Dodewaard and Borssele. Benefits and Drawbacks for the Netherlands. Report No. 47.
M. Wessels. 1984, 109p INIS-mf-9421
In Dutch.Published about 1983.
U.S. Sales Only.

In this writing, the main benefits and drawbacks of the functioning of the Dutch nuclear power plants at Dodewaard and Borssele are discussed. First, an introductory chapter is devoted to the nuclear developments in the Netherlands and Europe after World War II. Next, the economic aspects of the possible dismantlement of the Dodewaard and Borssele plants are considered. The last part deals with some other aspects like nuclear research and industrial activities in the Netherlands and their relation with Borssele and Dodewaard; safety aspects; the waste problem and non-proliferation problems. (Atomindex citation 15:068477)

536,668
DE85780620/GAR PC **A04/MF A01**
Japan Atomic Energy Research Inst., Tokyo.
Thermal Performance Test of the Hot Gas Ducts of HENDEL.
M. Hishida, K. Kunitomi, I. Ioka, K. Umenishi, and Y. Kondo. Nov 83, 75p JAERI-M-83-180
In Japanese.
U.S. Sales Only.

A hot gas duct provided with internal thermal insulation is supposed to be used for an experimental high-temperature gas-cooled reactor (VHTR). This type of hot gas duct has not been used so far in industrial facilities, and only a couple of tests on such a large-scale model of hot gas duct have been conducted. The present report deals with the results of thermal performance of the hot gas ducts which are installed as parts of a helium engineering demonstration loop (HENDEL). Uniform temperature and heat flux distribution at the surface of the duct were observed, the experimental correlations being obtained for the effective thermal conductivity of the internal thermal insulation layer. The measured temperature distribution of the pressure tube was in good agreement with the calculation by a TRUMP heat transfer computer code. The temperature distribution of the inner tube of VHTR hot gas duct was evaluated, and no hot spot was detected. These results would be very valuable for the design and development of VHTR. (Atomindex citation 15:070351)

536,669
DE85780621/GAR PC **A04**/MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
Seismic Analysis of Helical Coil Type Heat Exchanger. Modeling and Eigenvalue Analysis.
H. Yatabe, and I. Nishiguchi. Dec 83, 58p JAERI-M-83-212
In Japanese.
U.S. Sales Only.

The Intermediate Heat Exchanger (IHX) which forms the reactor coolant pressure boundary is one of the most important components of the Multipurpose Experimental Very High Temperature Gas-cooled Reactor (VHTR). This paper presents the result of the finite element modeling and the eigenvalue analysis of the IHX from our investigation of the seismic analyses of it in order to confirm its integrity in earthquakes. For the modeling, the structure of the IHX is separated into a helical tube bundle, inner and outer vessels and a centerpipe, and the eigenvalue analysis was carried out for each structure with the detailed three-dimensional finite element model. Then the simplified model of the whole structure of the IHX was constructed with the result of eigenvalue analysis. The results of the analysis with the simplified model show that the helical tube bundle and the centerpipe have the first natural frequency of 0.4 Hz in the same phase. (Atomindex citation 15:070352)

536,670
DE85780629/GAR PC **A05**/MF **A01**
International Atomic Energy Agency, Vienna (Austria).
Survey of Probabilistic Methods in Safety and Risk Assessment for Nuclear Power Plant Licensing.
Apr 84, 84p IAEA-TECDOC-308
U.S. Sales Only.

After an overview about the goals and general methods of probabilistic approaches in nuclear safety the main features of probabilistic safety or risk assessment (PRA) methods are discussed. Mostly in practical applications not a full-fledged PRA is applied but rather various levels of analysis leading from unavailability assessment of systems over the more complex analysis of the probable core damage stages up to the assessment of the overall health effects on the total population from a certain practice. The various types of application are discussed in relation to their limitation and benefits for different stages of design or operation of nuclear power plants. This gives guidance for licensing staff to judge the usefulness of the various methods for their licensing decisions. Examples of the application of probabilistic methods in several countries are given. Two appendices on reliability analysis and on containment and consequence analysis provide some more details on these subjects. (Atomindex citation 15:070567)

536,671
DE85780746/GAR PC **A10**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Establishment of the Fundamentals for a Catalogue of Rules Governing the Design of HTR Components for Temperatures Above 800 deg C.
Mar 84, 220p Juel-Spez-248
In German.
U.S. Sales Only.

When the HTR is used as a process heat generator system, its metal heat exchanger components are exposed to operating temperatures higher than 800 deg C. In this temperature range, there are no rules for component layout under nuclear law that might contain specifications on materials, design, and strength testing. The fundamentals of such regulations are now being established on the basis of a safety concept for the most important components, i.e. the steam reformer and the He/He heat exchanger. An analysis of the available conventional and nuclear regulations and guidelines shows that the safety philosophy of low-temperature components can not be applied to components with operating temperatures > 800 deg C. The ASME-CC N 47 guideline contains design rules for temperatures up to 800 deg C which cannot be extrapolated to higher temperatures. The future catalogue of rules will also take account of the experience gained with the THTR (= Thorium-Hochtemperaturreaktor). (ERA citation 10:018338)

536,672
DE85901142/GAR PC **A03**/MF **A01**
Sensors for Core Measurements.
H. Brixy. 1982, 31p CE-Trans-7964
Translated from Atomkernenerg. Kerntech.; 41: No. 3, 154-164(1982).
U.S. Sales Only. Portions of this document are illegible in microfiche products.

Temperature and neutron flux sensors used in the core region are exposed to environmental conditions which may impair their characteristics. The possibilities and limitations of some frequently used sensors are pointed out and different kinds of sensors are compared. (ERA citation 10:022657)

536,673
NUREG/CR-2531-REV-3/GAR PC **A05**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Introductory User's Manual for the U.S. Nuclear Regulatory Commission Reactor Safety Research Data Bank. Revision 3,
H. A. Hardy, and E. T. Laats. Mar 85, 97p EGG-2164-REV-3
Contract DE-AC07-76IDO1570
See also NUREG/CR-2531-REV-2.

The United States Nuclear Regulatory Commission (USNRC) has established the NRC/Division of Accident Evaluation (DAE) Data Bank Program to collect, store, and make available data from the many domestic and foreign water reactor safety research programs. Local direction of the program is provided by EG&G Idaho, Inc., prime contractor for the Department of Energy (DOE) at the Idaho National Engineering Laboratory (INEL). The NRC/DAE Data Bank Program provides a central computer storage mechanism and access software for data that is to be used by code development and assessment groups in meeting the code correlation needs of the nuclear industry. The administrative portion of the program provides data entry, documentation, training, and advisory services to users and the USNRC. The NRC/DAE Data Bank and the capabilities of the data access software are described in this document.

536,674
NUREG/CR-4191/GAR PC **A11**/MF **A01**
Argonne National Lab., Idaho Falls, ID.
Survey of Licensee Control Room Habitability Practices,
J. F. Boland, R. L. Brookshire, W. F. Danielson, J. W. Driscoll, and E. D. Graham. Apr 85, 231p ANL-85-13

The emphasis of this survey was to determine by field review the control-room habitability practices at three different plants, one of which is still under construction and scheduled to receive an operating license in 1986. The other two plants are currently operating, having received operating licenses in the mid-1970's and early 1980's. The major finding of this survey is that despite the fact that the latest control-room-habitability systems have become larger and more complex than earlier systems surveyed, the latest systems do not appear to be functionally superior. The major recommendation of this report is to consolidate into a single NRC document, based upon a comprehensive systems engineering approach, the pertinent criteria for control-room-habitability design.

536,675
NUREG-1061-V2/GAR PC **A09**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Report of the U.S. Nuclear Regulatory Commission Piping Review Committee. Volume 2. Evaluation of Seismic Designs - A Review of Seismic Design Requirements for Nuclear Power Plant Piping.
Apr 85, 182p
See also NUREG-1061-V1 and NUREG-1061-V2-ADD.

This document reports the position and recommendations of the NRC Piping Review Committee, Task Group on Seismic Design. The Task Group considered overlapping conservatism in the various steps of seismic design, the effects of using two levels of earthquake as a design criterion, and current industry practices. Issues such as damping values, spectra modification, multiple response spectra methods, nozzle and support design, design margins, inelastic piping response, and the use of snubbers are addressed. Effects of current regulatory requirements for piping design are evaluated, and recommendations for immediate licensing action, changes in existing requirements, and research programs are presented. Additional background information and suggestions given by consultants are also presented.

536,676
NUREG-1061-V2-ADD/GAR PC **A10**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Report of the U.S. Nuclear Regulatory Commission Piping Review Committee. Volume 2 (Addendum). Summary and Evaluation of Historical Strong-Motion Earthquake Seismic Response and Damage to Aboveground Industrial Piping.
Apr 85, 203p
See also NUREG-1061-V2.

Earthquake experience data for industrial piping has been summarized in this report. Conclusions and recommendations for improving the design of nuclear plant piping are made by the author. Input from R.L. Cloud, P. Yaner, and H. Shibata has been included. The material in this report served as background information for the NRC Piping Review Committee Seismic Design Task Group.

536,677
NUREG-1061-V5/GAR PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Report of the U.S. Nuclear Regulatory Commission Piping Review Committee. Volume 5. Summary - Piping Review Committee Conclusions and Recommendations.
Apr 85, 57p
See also NUREG-1061-V4.

This document summarizes a comprehensive review of NRC requirements for Nuclear Piping by the U.S. NRC Piping Review Committee. Four topical areas, addressed in greater detail in Volumes 1 through 4 of this report, are included: (1) Stress Corrosion Cracking in Piping of Boiling Water Reactor Plants, (2) Evaluation of Seismic Design, (3) Evaluation of Potential for Pipe Breaks, and (4) Evaluation of Other Dynamic Loads and Load Combinations. This volume summarizes the major issues, reviews the interfaces, and presents the Committee's conclusions and recommendations for updating NRC requirements on these issues.

536,678
PB85-186138/GAR PC **E03**/MF **E03**
Central Electricity Generating Board, Southampton (England). Technology Planning and Research Div.
Instabilities of the AGR (Advanced Gas Cooled Reactor) Fuel Assembly during On-Load Refuelling,
D. E. Hobson. c1985, 22p TPRD/M/1471/N85
Presented at ASME Multidivisional Symposium on Flow-Induced Vibration at New Orleans on December 1984.

During on-load refuelling of the Advanced Gas Cooled Reactor (AGR), gas flows at high velocity in the annular passage between the cylindrical fuel assembly and the channel in the reactor core causing the assembly to vibrate. The characteristics of the vibration are governed partly by the structural dynamics of the assembly, that is its mass, stiffness and damping distributions and mechanical constraints, but also by the behavior of the fluid contained within the annular passages which are very narrow and can vary in cross section along the length of the fuel assembly. Because of the narrowness, the coupling between the fluid and the structure is enhanced and this can lead to large transverse fluid forces when the assembly moves from its mean concentric position. The ways in which these forces can cause self-excited vibration of various structures, including one, two or more degrees of freedom systems, or a semi-infinite beam representing a fuel assembly, are discussed in an attempt to explain the observed behavior of the actual assembly during on-load refuelling, and in particular why stability is governed by the detailed aero-dynamic behavior of part of the annulus just above the reactor core.

18J. Reactor Materials

536,679
DE85700414/GAR PC **A04**/MF **A01**
Kyoto Univ., Osaka (Japan). Research Reactor Inst.
Chemical Interaction of Fuel and Cladding Tubes.
T. Kirihara, M. Yamawaki, N. Obata, and M. Handa. 1983, 65p KURRI-TR-233
In Japanese.
U.S. Sales Only.

It was attempted to take up the behavior of nuclear fuel in cores and summarize it by the expert committee on the irradiation behavior of nuclear fuel from fiscal 1976 to fiscal 1980 from the following viewpoints. The behavior of nuclear fuel in cores has been treated separately according to each reactor type, accordingly this point is reconsidered. The clearly understood points and the uncertain points are discriminated. It is made more easily understandable for people in other fields of atomic energy. This report is that of the group on the chemical interaction, and the first report of this committee. The chemical interaction as the behavior of fuel in cores is in the unseparable relation to the mechanical interaction, but this relation is not included in this report. The chemical interaction of fuel and cladding tubes under irradiation shows different phenomena in LWRs and FBRs, and is called SCC and FCC, respectively. But this point of causing the difference must be understood to grasp the behavior of fuel. The mutual comparison of oxide fuels for FBRs and LWRs, the stress corrosion cracking of Zircaloy tubes, and fuel-cladding chemical interaction in FBRs are reported. (Atomindex citation 16:002961)

536,680
DE85750289/GAR PC **A03**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Neutronenphysik und Reaktortechnik.
Significance of Cesium in LMFBR and LWR Safety Analysis.
W. Breitung, and G. Schumacher. May 84, 50p KFK-3716
U.S. Sales Only.

The significance of cesium, which is the most abundant volatile fission product in reactor fuels, is shown for LMFBR and LWR safety analysis. The conclusion for the LMFBR case is that apparently a high potential for fuel motion induced by cesium pressures exists. The magnitude of this effect should be clarified by in-pile vapor pressure measurements on Cs sub 2 UO sub 4 and Cs sub 2 UOsub(3.56). In the LWR case, cesium isotopes play an important role in the overall health risk from released fission products. Cesium vapor pressure measurements on Cs sub 2 MoO sub 4 and Cs sub 2 UO sub 4 would provide fundamental input data for mechanistic LWR release codes which are presently under development at different laboratories. A test matrix of five experiments is proposed. The tests are based on already existing in-pile techniques. (ERA citation 10:011164)

536,681
DE85780407/GAR PC **A07**/MF **A01**
Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro.
Standard Model for Safety Analysis Report of Hexafluoride Power Plants from Natural Uranium.
Jan 83, 149p CNEN-NE-1.11
In Portuguese.
U.S. Sales Only.

The standard model for safety analysis report for hexafluoride production power plants from natural uranium is presented, showing the presentation form, the nature and the degree of detail, of the minimal information required by the Brazilian Nuclear Energy Commission - CNEN. (Atomindex citation 15:071879)

536,682
DE85780464/GAR PC **A03**/MF **A01**
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German D.R.).
Procedures and Practices in Nuclear Material Accounting and Reporting in the GDR.
M. Burmester, and M. Helming. 1984, 32p SAAS-316, CONF-831181-1
Seminar on safety in nuclear power plant operation, Vienna, Austria, 21 Nov 1983.
U.S. Sales Only.

The typical features of the GDR's nuclear material safeguards system are pointed out by analysing the nuclear material data reporting to the IAEA since 1972. Extent and consequences of the application of modern electronic data registration and processing methods at State and MBA levels are considered and an outlook is given for planned developments and extensions of the data processing system with a view to making the data exchange between the main users of nuclear material and the State control authority more effective and the work of the State control authority itself more efficient. (Atomindex citation 15:073344)

536,683
DE85780600/GAR PC **A06**/MF **A01**
Instituto Militar de Engenharia, Rio de Janeiro (Brazil).
Evaluation Model for PWR Irradiated Fuel.
Tese (M.Sc.),
I. C. Gomes. 1983, 169p INIS-BR-165
In Portuguese.
U.S. Sales Only.

The individual economic value of the plutonium isotopes for the recycle of the PWR reactor is investigated, assuming the existence of a market for this element. Two distinct market situations for the stages of the fuel cycle are analysed: one for the 1972 costs and the other for costs of 1982. Comparisons are made for each of the two market situations concerning enrichment of the U-235 in the uranium fuel that gives the minimum cost in the fuel cycle. The method adopted to establish the individual value of the plutonium isotopes consists on the economical analyses of the plutonium fuel cycle for four different isotopes mixtures refering to the uranium fuel cycle. (Atomindex citation 15:068508)

536,684
DE85780749/GAR PC **A03**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie.
Absorptive Separation of NOsub(X) from Dissolver off-Gas.
H. Ringel. Jun 84, 47p Juel-1930
In German.
U.S. Sales Only.

After precleaning the dissolver off-gas contains, besides the noble gases Xe and Kr, about 0.5 vol.% each of NOsub(x) and H sub 2 O. For the removal of these NOsub(x) and H sub 2 O residues to below 1 ppm, an adsorptive gas cleaning process has been developed and tested on a lab-scale. For the process, an acid resistant molecular sieve was selected and its properties investigated with respect to application; e.g. the dependence of the adsorption capacity on temperature, gas composition and face velocity. By the operation of a lab-scale facility with 400 Nl/h continuous off-gas throughput the suitability of the adsorption process has been demonstrated for off-gas cleaning and recycling of the separated NO sub 2 and H sub 2 O to the dissolver. (ERA citation 10:017965)

536,685
DE85780757/GAR PC **A06**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie.
Distribution of Th(NO Sub 3) sub 4 , UO sub 2 (NO Sub 3) sub 2 and HNO sub 3 Between an Aqueous Phase and an Organic Tributyl Phosphate Phase.
T. Nakashima, and E. Zimmer. May 84, 113p Juel-1920
In German.
U.S. Sales Only.

The distribution of Th(NO sub 3) sub 4 , UO sub 2 (NO sub 3) sub 2 and HNO sub 3 between an aqueous phase and an organic phase, consisting of 30 Vol.% tributyl phosphate in dodecane, has been experimentally investigated. About 120 distribution data have been determined in the concentration ranges that can be seen in the THOREX process for reprocessing spent thorium bearing fuel. Based on the experimental data, two computer programs have been developed which make possible interpolations and, to some extent, extrapolations. With model 1, concentrations in the organic phase can be calculated if that in the aqueous phase are known. With model 2, concentrations in the aqueous phase can be calculated vice versa. Besides the description of the calculation models, a large body of calculated data can be found in this report. In addition, a calculation mode is presented that makes possible the calculation of distribution data for very low thorium concentrations. (ERA citation 10:017964)

536,686
DE85780799/GAR PC **A06**/MF **A01**
Centro de Informacoes Nucleares, Rio de Janeiro (Brazil).
Nuclear Fuel Cycle. Vol. 1. International Overview.
1983, 105p INIS-BR-179
In Portuguese.
U.S. Sales Only.

Nuclear fuel cycle information in the main countries that develop, supply or use nuclear energy is presented. Data about Japan, FRG, United Kingdom, France and Canada are included. The information is presented in a tree-like graphic way. (Atomindex citation 16:003613)

536,687
DE85780800/GAR PC **A07**/MF **A01**
Centro de Informacoes Nucleares, Rio de Janeiro (Brazil).
Nuclear Fuel Cycle. Vol. 2. International Overview.
1984, 126p INIS-BR-180
In Portuguese.
U.S. Sales Only.

Nuclear fuel cycle information in some countries that develop, supply or use nuclear energy is presented. Data about Argentina, Australia, Belgium, Netherlands, Italy, Denmark, Norway, Sweden, Switzerland, Finland, Spain and India are included. The information is presented in a tree-like graphic way. (Atomindex citation 16:003614)

18K. Reactor Physics

536,688
DE85006553/GAR PC **A02**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Cyclic Control Oscillations of Arbitrary Time-Dependent Reactivity Variation.
J. S. Lan, D. L. Duncan, and R. P. Omberg. Sep 84, 18p HEDL-SA-3169-FP, CONF-841105-65
Contract AC06-76FF02170
Joint meeting of the American Nuclear Society and the Atomic Industrial Forum, Washington, DC, USA, 11 Nov 1984.

Although the control oscillator method is widely being used in measuring reactor parameters and to investigate reactor stability, this useful and practical reactor kinetics problem has not been solved analytically for arbitrary input oscillations. It is the purpose of this paper to show that the analytical solution of power response to time-dependent reactivity oscillations can be derived from the well-known method of singular perturbation for an arbitrary input oscillation. With the differential equations describing a source-free reactor under arbitrary reactivity change at various time steps, it is possible to integrate the precursor balance equation through the application of prompt-jump approximation to the neutron balance equation. The uniqueness of this analytical solution is that it covers an unlimited number of arbitrary-reactivity oscillatory cycles with few simple mathematical functions. (ERA citation 10:022655)

536,689
DE85750640/GAR PC **A02**/MF **A01**
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses (France). Dept. d'Analyse de Surete.
Maracas Program: Study of 5% Enriched Uranium Dioxide Criticality.
M. Guillemot, L. Maubert, and J. C. Manaranche. Jul 83, 8p CEA-CONF-7240, CONF-821103-98, DSN--640
In French.American Nuclear Society winter meeting, Washington, DC, USA, 14 Nov 1982.
U.S. Sales Only.

The UO sub 2 criticality French research program in the field of mean fission groups lower than 14.2 is shortly presented. The experimental installation to study the under-critical UO sub 2 masses containing 1% of their weight of humidity are briefly presented. (ERA citation 10:018354)

18M. Reactors (Non-Power)

536,690
DE85780490/GAR PC **A02**/MF **A01**
Universidade Federal de Pernambuco, Recife (Brazil). Dept. de Energia Nuclear.

Project and Construction of a Pneumatic System for the Transference of Samples to a Neutron Generator.
A. N. de Carvalho. 1983, 18p INIS-BR-221
In Portuguese.
U.S. Sales Only.

A prototype of a system for the transport of irradiated samples to and from a neutron generator, was constructed, using compressed air as propeller agent. Compressed air was injected through electrically driven values. The sample, transported by the pressure wave, was inserted into a PVC tube 50m long and weighing 23.0 g. The first tests were carried out in order to determine the times needed to transport the above-mentioned PVC support along a PVC tube of 3m length and 3/4 diameter for different air pressures applied; it was verified that for pressures between 3.0 and 8.0 kgf/cm exp 2 , transport times were always smaller than 2 seconds. These results showed the viability of constructing a definitive system, already projected. (Atomindex citation 15:073228)

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

536,691
AD-A153 666/3/GAR PC **A05/MF A01**
Hamilton Technology, Inc., Lancaster, PA.
Product Improvement Program for the M577 Fuze. Volume 1. Redesigned Timer.
Final rept. Jun 79-Apr 83,
T. F. Slagle, A. L. Meissner, T. W. Perkins, and E. Chesky. Mar 85, 82p ARLCD-CR-85002-VOL-1, SBI-AD-E401 312
Contract DAAK10-79-C-0169
Project engineers: Thomas W. Perkins, Edwina Chesky. See also Volume 2, AD-A153 667.

The objective of this project was to redesign the timer gear train components to decrease the manufacturing cost of the M577 fuze. In addition, methods of using the scroll movement as a means of measuring the timer output were investigated. In the proposed design, the ring gear used to transmit the torque from the mainspring was replaced by an external drive gear on the scroll. This change eliminated one part and simplified another. Three of the plates were redesigned as die castings; two of these were combined into one plate.

536,692
AD-A153 667/1/GAR PC **A02/MF A01**
Hamilton Technology, Inc., Lancaster, PA.
Product Improvement Program for the M577 Fuze. Volume 2. Redesigned Escape Wheel and Lever.
Final rept.,
A. L. Meissner, T. W. Perkins, and E. Chesky. Mar 85, 21p ARLCD-CR-85002-VOL-2, SBI-AD-E401 313
Contract DAAK10-81-C-0172
Project engineers: Thomas W. Perkins, Edwina Chesky. See also Volume 3, AD-A153 668.

The objective of this contract was to redesign the timer escape wheel and lever to make more efficient use of the input torque and to provide a locking feature for the timer spin detent after it spins out. This redesign reduced the undesirable effects of balloting during ballistics by eliminating mechanical interference in the escapement. Ballistic test results with the redesigned escape wheel and lever were excellent. The redesign of the timer spin detent system was dropped because a ballistic test program that could determine whether the redesigned spin detent solves the balloting program could not be found.

536,693
AD-A153 668/9/GAR PC **A02/MF A01**
Hamilton Technology, Inc., Lancaster, PA.
Product Improvement Program for the M577 Fuze. Volume 3. Redesign of Setting Mechanism.
Final rept. Mar 80-Jun 82,
A. L. Meissner, T. W. Perkins, and E. Chesky. Mar 85, 9p ARLCD-CR-85002-VOL-3, SBI-AD-E401 314
Contract DAAK10-80-C-0063
Project engineers: Thomas W. Perkins, Edwina Chesky. See also Volume 4, AD-A153 669.

The objective of this task was to redesign the setting mechanism for the M577 fuze in order to lower the cost. The proposed design replaces the dowel pins and stake used to secure the setting ring gears with two tabs die cast as part of the no. 1 plate. This design depends on the successful completion of the timer redesign product improvement program.

536,694
AD-A153 669/7/GAR PC **A02/MF A01**
Hamilton Technology, Inc., Lancaster, PA.
Product Improvement Program for the M577 Fuze. Volume 4. Redesigned Timer Lever Assembly.
Final rept. Aug 80-Feb 84,
T. F. Slagle, A. L. Meissner, T. W. Perkins, and E. Chesky. Mar 85, 23p ARLCD-CR-85002-VOL-4, SBI-AD-E401 315
Contract DAAK10-80-C-0063
Project engineers: Thomas W. Perkins, Edwina Chesky. See also Volume 5, AD-A153 670.

The objective of this project was to design a timer lever assembly which eliminates the lever staff and pallet supports. A design was conceived which combined the aluminum lever staff and pallets supports with the steel lever staff and pallet pins. Because of the required staking operation, the hardness of the lever staff and pallet pins had to be decreased from the current design. Laboratory and environmental testing were performed with satisfactory results. However, after ballistic testing, it was determined the pallet pins were not hard enough to withstand the forces in the 155mm, Zone 8 (203 Charge), weapon without bending and affecting the timing accuracy. This design was then dropped from further consideration.

536,695
AD-A153 670/5/GAR PC **A02/MF A01**
Hamilton Technology, Inc., Lancaster, PA.
Product Improvement Program for the M577 Fuze. Volume 5. Combined Safe Separation Device (SSD) Spacer and Plate.
Final rept. Feb 81-Oct 84,
T. F. Slagle, A. L. Meissner, T. W. Perkins, and E. Chesky. Mar 85, 23p ARLCD-CR-85002-VOL-5, SBI-AD-E401 318
Contract DAAK10-81-C-0055
Project Engineers: Thomas W. Perkins, Edwina Chesky. See also Volume 6, AD-A153 671.

The objective of this task was to develop a combined safe separation device (SSD) spacer and plate. The proposed design combines the SSD top plate, spacer, and rotor shaft into a zinc die cast part. The projected cost savings is $0.167 per fuze not including tooling, general and administrative expenses, and profits.

536,696
AD-A153 671/3/GAR PC **A02/MF A01**
Hamilton Technology, Inc., Lancaster, PA.
Product Improvement Program for the M577 Fuze. Volume 6. Lower Cost Trigger Shafts.
Final rept. Mar 81-Jul 82,
J. C. Yoo, A. L. Meissner, T. W. Perkins, and E. Chesky. Mar 85, 25p ARLCD-CR-85002-VOL-6, SBI-AD-E401 316
Contract DAAK10-80-C-0063
Project engineers: Thomas W. Perkins, Edwina Chesky. See also Volume 1, AD-A153 666.

The objective of this report was to reduce the cost of the trigger shafts in M577 fuzes through the use of 2024 aluminum instead of 416 stainless steel. All four shafts in the trigger were tested using aluminum. In the final analysis, two of these, the safety plate shaft and the release lever shaft, were recommended for implementation in aluminum.

536,697
AD-A153 824/8/GAR PC **A04/MF A01**
Oak Ridge National Lab., TN.
Chemical Characterization and Toxicologic Evaluation of Airborne Mixtures. The Chemical and Physical Characterization of Phosphorus Smokes for Inhalation Exposure and Toxicology Studies.
Final rept. 1982-1984,
R. S. Brazell-Ramsey, J. H. Moneyhun, and R. W. Holmberg. Jun 84, 63p Rept no. ORNL/TM-9571

The chemical and physical properties of the aerosols produced from the combustion of red phosphorus containing butyl rubber (RPBR) and white phosphorus impregnated in felt (WPF) have been examined, The aerosols were produced at a uniform concentration by extruding softened raw material and burning the emerging filament or by igniting fragments of the formulations in a convective air flow. Aerosol particle sizes were found to be within the respirable range, varying from 0.4 to 1.0 micrometer depending upon generation conditions and aerosol age at collection, Chemically, both RPBR and WPF aerosols were found to be very similar, composed primarily of water and phosphoric acids. Organic compounds and inorganic gases were detected only at trace levels.

536,698
AD-A153 868/5/GAR PC **A02/MF A01**
Advanced Technology and Research, Inc., Burtonsville, MD.
NATO SEA GNAT Program.
Final rept. 20 Jan-31 Dec 84,
C. F. Peer. 4 Mar 85, 5p
Contract N60921-83-D-0143

Test and Evaluation plans and hazards analyses were prepared. Discussions were held with the Weapon Systems Explosive Seafety Review Board (WSESRB) to obtain safety approval.

19D. Explosions, Ballistics, and Armor

536,699
AD-A153 545/9/GAR PC **A03/MF A01**
FMC Corp., San Jose, CA. Ordnance Engineering Div.
Cast Aluminum Components. Volume 3.
Final rept. on Phase 1,
R. L. Malik. Dec 83, 27p TACOM-TR-12908
Contract DAAK30-80-C-0133

This report presents the results of the supplementary ballistic tests effort for the verification and qualification of the performance of the cast turret designed in Phase I. The ballistic performance curves established by this program reconfirmed the cast turret as ballistically equivalent to the welded plate turret with 10 percent increase in weight. The tests also confirmed that the design approach used for the design of the case turret in Phase I is similar and equivalent to the analytical approach of ballistic performance curves. Plate areas in the cast turret overlaid with steel armor passed all the system performance ballistic tests. Ballistic tests performed on 7039 aluminum armor plates of varying thicknesses with different obliquities established a direct comparison of ballistic performance of 7039 armor rolled plates with A206 cast plates under KE threat.

536,700
AD-A153 654/9/GAR PC **A04/MF A01**
Belytschko (Theodore B.), Inc., Winnetka, IL.
New Interaction Algorithm with Erosion for EPIC-3.
Final rept. Mar 83-Mar 84,
T. Belytschko, and J. I. Lin. Feb 85, 64p ARBRL-CR-540, SBI-AD-F300 604
Contract DAAK11-83-C-0020

This report documents modifications which were incorporated in the EPIC-3 (5, 6) computer program (Elastic-Plastic Impact Computations in Three Dimensions) in order to treat impact and penetration with erosion. EPIC-3 is a finite element program with explicit time integration which is primarily intended for simulation of solids to short intense loads, such as in impact or explosive detonations. A variety of material laws including elastic-plastic solids, concrete/geological materials and explosives are included. As part of this modification, two major features were added: 1. a hexahedral element with one-point quadrature and hourglass control; 2. An algorithm for treating projectile-target interaction in situations where material erosion can occur

arbitrarily in the target or projectile. A key attribute of the interaction algorithm is that it requires no definition or tracking of sliding interfaces. Instead, the interaction is handled by operations on slave nodes and master elements. Because of this feature of the algorithm, the erosion of an element requires no redefinition of the interface and thus avoids the complexity associated with sliding interfaces in these situations. The hexahedral element was incorporated primarily because it simplifies the new interaction algorithm. However, it also increases the speed of the computer program and avoids the excessive stiffness of the tetrahedra. Solutions are presented for three projectile penetration problems, ranging from a simple problem primarily intended to verify the computer code to a large-scale problem involving erosion of both the projectile and target.

536,701

AD-A153 655/8/GAR PC **A03/MF A01**
Army Ballistic Research Lab., Aberdeen Proving Ground, MD.
Theoretical Study of the Propagation of a Mass Detonation.
Final rept.,
P. M. Howe, and A. R. Kiwan. Feb 85, 29p BRL-TR-2640, SBI-AD-F300 609

The mass detonation problem was formulated as a dynamic probabilistic process, equivalent to a specialized bond problem in percolation theory. Percolation theory predicts that there exists a critical probability, above which there is a nonzero probability that an explosion will propagate throughout the munitions array. The critical probabilities for the generalized bond and site problems provide lower and upper bounds, respectively, for the critical probability for mass detonation. A Monte Carlo model was developed and exercised for two and three dimensional munitions arrays. The effects of synergy resulting from simultaneous detonation of nearest neighbors was examined, and anisotropies resulting from heightened or reduced propagation probabilities in one direction was addressed. It was shown that significant reductions in mass detonability can be obtained by exploiting anisotropic effects resulting from munition design.

536,702

AD-A153 828/9/GAR PC **A03/MF A01**
Naval Surface Weapons Center, Dahlgren, VA.
Confidence Intervals for CEP When the Errors Are Elliptical Normal.
Final rept.,
A. E. Taub, and M. A. Thomas. Nov 83, 43p Rept no. NSWC/TR-83-205

A common parameter for describing the accuracy of a weapon is the circular probable error, generally referred to as CEP. CEP is simply the bivariate analog of the univariate probable error and measures the radius of a mean-centered circle which includes 50% of the bivariate probability. In the case of circular normal errors where the error variances are the same in both directions, CEP can be expressed as a function of the common miss distance standard deviation. Also, CEP can be expressed as a function of the common miss distance standard deviation. Also, CEP estimators based on observed miss distances are easily formulated and can be used to construct confidence intervals for CEP. In the case of elliptical normal errors, CEP cannot be expressed explicitly as a function of the miss distance standard deviations. Here, one must obtain CEP by numerical methods or by referring to tabular values. This has led to the development of a number of approximations by which CEP can be expressed as a function of the miss distance standard deviations. While CEP estimators based on observed miss distances are easily formulated from these approximations, their probability distributions are too complicated to be useful for CEP confidence intervals. In this report, these probability distributions are approximated with distributions which are more practical for the formulation and application of CEP confidence intervals. Approximate CEP confidence intervals are then formulated and their accuracy determined through Monte Carlo sampling.

536,703

AD-A153 941/0/GAR PC **A03/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 1. Methodology and Application to Fragment Sensitive Targets in the Absence of Delivery Error.
Final technical rept. May 83-Jan 85,
B. D. Sivazlian. Feb 85, 41p AFATL-TR-84-92-VOL-1, SBI-AD-E801 121
Contract F08635-83-C-0202
See also Volume 2, AD-A153 942.

The problem of computing the uncertainty with the probability of kill when using the two-parameter Carleton damage function is considered. It is assumed that the input parameters are not exactly, and that the measure of uncertainty in these parameters is given. Two types of estimation procedures are used: the Taylor's series estimation procedure and a subjective estimation procedure. Two inferential estimation procedures are also discussed.

536,704

AD-A153 942/8/GAR PC **A03/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 2. Application to Blast Sensitive Targets in the Absence of Delivery Error.
Final technical rept. May 83-Jan 85,
B. D. Sivazlian. Feb 85, 31p AFATL-TR-84-92-VOL-2, SBI-AD-E801 122
Contract F08635-83-C-0202
See also Volume 3, AD-A153 943.

The problem of computing the uncertainty associated with the probability of kill due to blast in the absence of weapon fragmentation and aiming error is considered. The damage function due to blast is assumed to be piecewise linear function of the distance between the blast point and the target point. Under the assumption that the input parameters are uniformly distributed, explict expressions are obtained for the expectation and variance of kill probability.

536,705

AD-A153 943/6/GAR PC **A03/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 3. Application to Fragment Sensitive Targets in the Presence of Delivery Error.
Final technical rept. May 83-Jan 85,
B. D. Sivazlian. Feb 85, 39p AFATL-TR-84-92-VOL-3, SBI-AD-E801 123
Contract F08635-83-C-0202
See also Volume 4, AD-A153 944.

The problem of computing the uncertainty associated with the probability of kill due to fragmentation in the presence of aiming error and in the presence of blast is considered. It is assumed that the damage due to fragmentation can be approximated by two-parameter Carleton damage function. The aiming error in the delivery of the weapon is assumed to be Gaussian and independent in each of the range and deflection directions.

536,706

AD-A153 944/4/GAR PC **A04/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 4. Application to Blast Sensitive Targets in the Presence of Delivery Error.
Final technical rept. May 83-Jan 85,
B. D. Sivazlian, and J. F. Mahoney. Feb 85, 59p AFATL-TR-84-92-VOL-4, SBI-AD-E801 125
Contract F08635-83-C-0202
See also Volume 5, AD-A153 945.

An expression for the probability of kill, of stationary ground point-target is derived subject to the following assumptions: the target is killed solely because of blast; the aiming errors of the air-delivered weapon in both range and defection are independently and normally distributed; the extent of damage to the target is given by a piecewise linear function of the distance between the target and the point of impact. An expression for the variance of probability of kill is presented. Numerical examples and four appendices are provided.

536,707

AD-A153 945/1/GAR PC **A03/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 5. Techniques of the Methodology of Volumes 1, 2, 3, and 4.
Final rept. May 83-Jan 85,
J. F. Mahoney. Feb 85, 28p AFATL-TR-84-92-VOL-5, SBI-AD-E801 126
Contract F08635-83-C-0202
See also Volume 6, AD-A153 946.

This report consists of a collection of the relevant equations which are developed in Volumes I, II, III, and IV "Variability of Measures of Weapons Effectiveness". The equations presented are for the estimation of the weapon probability of kill and for the variance of the probability of kill for ground targets which are either sensitive to blast or to fragmentation when delivery error is present and when it is not.

536,708

AD-A153 946/9/GAR PC **A05/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 6. Estimation of the Weapons Parameters and Their Variances in the Carleton Damage Function.
Final technical rept. May 83-Jan 85,
A. Black, J. F. Mahoney, and B. D. Sivazlian. Feb 85, 77p AFATL-TR-84-92-VOL-6, SBI-AD-E801 124
Contract F08635-83-C-0202
See also Volume 7, AD-A153 947.

For the three-parameter Carleton damage function, the techniques of linear and non-linear regression are used to estimate the three parameters as well as their variance - covariance matrix. The computational aspect of the estimation is discussed, including language, program and subroutine. 13 weapon/target situations, numerical results are provided.

536,709

AD-A153 947/7/GAR PC **A05/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 7. Effectiveness Indices in Stick Delivery of Weapons.
Final technical rept. May 83-Jan 85,
B. D. Sivazlian. Feb 85, 76p AFATL-TR-84-92-VOL-7, SBI-AD-E801 127
Contract F08635-83-C-0202
See also Volume 8, AD-A153 948.

The probability of kill of a fragment sensitive target due to the stick delivery of multiple weapons subject to ballistic and aiming error is computed. It is assumed that the probability of kill associated with each weapon can be approximated by the Carleton damage function. Both the ballistic errors and the aiming errors are assumed to have a Gaussian distribution in each of the range and deflection direction. Each weapon is subject to ballistic errors which are statistically independent, but the entire stick pattern is subject as a whole to aiming error. A decomposition principle is used to obtain a general expression for the probability of kill. The variance of the probability of kill is estimated assuming that the uncertainty is present in the measurements of the input parameters.

536,710

AD-A153 948/5/GAR PC **A04/MF A01**
Florida Univ., Gainesville. Dept. of Industrial and Systems Engineering.
Variability of Measures of Weapons Effectiveness. Volume 8. Effectiveness Indices in Multiple and Guided Weapons.
Final technical rept. May 83-Jan 85,
B. D. Sivazlian. Feb 85, 58p AFATL-TR-84-92-VOL-8, SBI-AD-E801 128
Contract F08635-83-C-0202
See also Volume 1, AD-A153 941.

Mathematical models are developed for obtaining expressions for the probability of kill for multiple weapons under stick delivery, for laser guided bombs, and for guided weapons. It is assumed that the damage function can be approximated by the Carleton damage function and that delivery errors are present having predefined distributions. The variability in probability kill is computed.

19E. Fire Control and Bombing Systems

536,711
AD-A153 893/3/GAR PC **A04/MF A01**
General Electric Co., Pittsfield, MA. Ordnance Systems.
Basic System Configuration Determination Study. Advanced Hig-Kill Indicator System.
Final rept. Oct 77-Jun 79.
29 Jun 79, 68p Rept no. OS-79-21
Contract DABT23-77-C-1148

The passive HKI concept developed by General Electric is based on the use of a solid-state television camera on the firing vehicle and a position reference flashtube mounted on the target vehicle to measure the relative position of target and firing vehicle. Both camera and flashtube are filtered to exclude visible light and operate in the near-IR band. This basic measurement, which is performed at trigger pull in conjunction with measurements made by APLS, provides the basis for determining the impact location of an electronic analog of selected real Army rounds. In addition to describing the proposed HKI concept and the major alternative concepts considered, the report contains a series of technical memos which reveal some of the thought and evaluation that occurred during the course of the study. These memos frequently go into technical details in considerable depth and are referenced in the report text where appropriate. The technical memos are numbered from 1 to 17 and are included as Appendices A through Q.

20. PHYSICS

20A. Acoustics

536,712
AD-A153 571/5/GAR PC **A02/MF A01**
Woods Hole Oceanographic Institution, MA. Dept. of Ocean Engineering.
Ocean Acoustic Tomography: Travel Time Biases,
Technical rept.,
J. L. Spiesberger. Jan 85, 20p Rept no. WHOI-CONTRIB-5722
Contract N00014-82-C-0019, Grant NSF-OCE80-17309
Pub. in Jnl. of Accousical Society of America, v77 n1 p83-100, Jan 85.

The travel times of acoustic rays tracked through a climatological sound-speed profile are compared with travel times computed through the same profile containing an eddy field. The exact travel time difference is compared with its constituent terms, one of which is linearly related to the deviation of the sound speed (referenced to the climatological profile) and the others which are nonlinearly related to the deviation. At ranges that are much greater than the eddy scale and for eddy fields whose range-averaged temperature anomaly is small, the numerical results are: (1) the values of the nonlinear terms are insensitive to the positions of the eddies and (2) the nonlinear terms are approximately proportional to the range between the source and receiver and to the square of the eddy anomaly. At a 1084-km range in the east Atlantic at 24 N (36 N) the nonlinear terms can account for 17% (90%) of the exact travel time change where the temperature anomalies associated with the eddies are typically + or - 0.5 C (+ or - 1 C). Linearized inversions (based on the linear estimator of the travel time difference) which use the exact travel time differences for data should yield biased results since the average values of the nonlinear terms are not zero. If an a prior knowledge of the eddy spectrum is known, the nonlinear terms could be computed for each ray and subtracted from the exact travel time change. It may then be beneficial to use the corrected set of travel time differences in a linear inversion which would require no iteration.

536,713
AD-A153 618/4/GAR PC **A05/MF A01**
Naval Postgraduate School, Monterey, CA.
Experimental Study of the Pressure in a Fast Bottom Beneath the Apex of an Overlying Fluid Wedge.
Master's thesis,
M. K. Hedrick. Dec 84, 90p

The pressure profile in a fast bottom directly beneath the apex of a fluid wedge was investigated experimentally and compared with a computer model, which used saddle-point approximations based on image theory to predict the pressure under varying acoustical and geometrical parameters. Transducer fluid served as the fluid wedge overlying a water substrate. The fluid in the wedge was contained in an enclosed structure and was separated from the substrate by a thin Mylar membrane. The density ratio was 0.98 and the speed of sound ratio was 0.91. The experiment was conducted at a frequency of 88.2 kHz. Data were taken with the enclosure pressurized and nonpressurized for wedge angles of two through ten degrees, and with projector elevation angles at one-half and one-quarter the wedge angle. The experimental results agreed with theoretical predictions. Additionally, acceptable agreement was achieved between pressurized and nonpressurized conditions.

536,714
AD-A153 620/0/GAR PC **A06/MF A01**
Mississippi Univ., University. Physical Acoustics Research Lab.
Sound Amplification by Relaxation Processes in Nitrogen and Mixtures of Nitrogen with Helium and Hydrogen.
Doctoral thesis,
F. D. Shields, and D. Iskandar. 27 Mar 85, 105p Rept no. PARGUM-85-01
Contract N00014-84-C-0193

Experimental investigation of the sound amplification by relaxation processes in vibrationally excited gases has been made. Experiments were conducted in pure nitrogen and mixtures of nitrogen with helium and hydrogen. The nitrogen was vibrationally excited by an electrical discharge. A sound pulse, propagated through the excited gas under study, was Fourier analyzed to determine the absorption and velocity as a function of time and frequency. A numerical solution developed by Shields 22 was used to calculate the absorption and velocity in unexcited gases. The observed and calculated absorption and velocity were then compared to determine the gain and temperature of the gas. In pure nitrogen and mixtures of nitrogen and helium, in which the vibrational relaxation time was much longer than the sound period, gain was not observed. Gain was observed in three cases: 50% He - 50% N2 at 40 Torr, 10% H2 - 90% N2 at 40 and 20 Torr. In the first two mixtures it was possible to observe the change in gain with time as the vibrational temperature decayed away.

536,715
AD-A153 781/0/GAR PC **A03/MF A01**
Naval Ocean Research and Development Activity, NSTL Station, MS.
Geoacoustic Models: Washington State Continental Margin.
Final rept.,
D. Lavoie. Jan 85, 28p Rept no. NORDA-85

Knowledge of the Washington continental margin geology is critical in predicting acoustic response, since the region is a shallow-water, bottom-interacting area. The sediments are primarily terrigenous with less than 3% calcareous constituents on the shelf and slope and less than 10% calcareous constituents in the basin areas of the region. On the Washington continental shelf, sediments form bands of sands, silty sands, and muds that roughly parallel the coastline as a result of prevailing current patterns. North of the Strait of Juan de Fuca, sediment grain-size patterns are highly irregular and include significant gravel deposits. The entire continental shelf is covered with only 150 meters and less of unconsolidated sediment. Sediment cover on the slope is more variable and ranges between a few meters on the tops of ridges to as much as 1600 meters in the valleys. The Cascadia Basin contains the thickest sediment (2500 meters) opposite the Columbia River and thins toward the Juan de Fuca Ridge. Acoustic basement is a siltstone beneath the shelf, a mudstone beneath much of the slope, and oceanic basalt beneath the deep-sea fans and basins. Seven geoacoustic provinces have been defined and mapped on the basis of sediment type and grain size. Each geoacoustic province has an accompanying geoacoustic model suitable for input to acoustic field models in which sediment physical properties are modeled as a function of depth.

536,716
PB85-189777/GAR PC **E05/MF E05**
Southampton Univ. (England). Inst. of Sound and Vibration Research.
Models for Describing Active Noise Control in Ducts.
Technical rept.,
S. J. Elliott, and P. A. Nelson. Apr 84, 69p ISVR-TR-127

A number of methods have been proposed for controlling the sound propagating in a duct by introducing 'secondary' sources to cancel the original sound wave produced by a 'primary' source. The physics of such active noise control (a.n.c.) systems is fairly straightforward and well understood. It is the purpose of this memorandum to examine some of the most widely used models for active noise control in ducts and in so doing to elucidate the assumptions inherent in the models so that each model can be wisely applied.

20B. Crystallography

536,717
AD-A153 433/8 Not available NTIS
Northwestern Univ., Evanston, IL. Dept. of Civil Engineering.
Finite Plastic Flow of Crystalline Solids and Geomaterials,
S. Nemat-Nasser. Dec 83, 15p ARO-18945.3-EG
Contract DAAG29-82-K-0147
Availability: Pub. in Jnl. of Applied Mechanics, v50 p1114-1126 Dec 83 (No copies furnished by DTIC/NTIS).

Certain fundamentals of finite-deformation elastoplastic flow of crystalline solids and geomaterials are discussed in this reprint from microscopic and macroscopic phenomenological points of view. In the first case, physically based constitutive relations for microelements are formulated on the basis of slip-induced plastic deformation with due account of possible frictional or pressure dependencies and inelastic volumetric changes. The close relation between the double-slip theory of single crystals and that granular materials is discussed. The calculation of overall instantaneous moduli in terms of the local quantities for arbitrary strains and rotations are reviewed. Then, attention is focused on phenomenological constitutive relations which apply to both metals and geomaterials. Specific results are given for an isotropic-kinematic hardening model, including frictional and plastic dilatancy effects. Finally, certain fundamental thermodynamic aspects of finite-deformation inelasticity are reviewed, emphasizing conditions under which flow potentials exist.

536,718
AD-A153 719/0/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Zone-Melting Recrystallization of 3 Inch Diameter Si Films on SiO2 -coated Si Substrates.
Journal article,
J. C. C. Fan, B. Y. Tsaur, R. L. Chapman, and M. W. Geis. 15 Jul 82, 4p JA-5330, ESD-TR-85-073
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v41 n2 p186-188, 15 Jul 82.

We have constructed a scaled-up graphite strip-heater system that permits routine zone-melting recrystallization of 3-in.-diam Si films on SiO2-coated Si wafers. The recrystallized films are similar in crystal quality to those obtained previously in a smaller system, except that they contain higher densities of small protrusions along the subgrain boundaries. Seeded recrystallization has been accomplished by scribing a strip opening, that extends through the Si and SiO2 films to the Si wafer.

536,719
AD-A153 724/0/GAR PC **A02/MF A01**

Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Amorphous-Crystalline Boundary Dynamics in CW Laser Crystallization.
Journal article,
H. J. Zeiger, J. C. C. Fan, B. J. Palm, R. L. Chapman, and R. P. Gale. 15 Mar 82, 18p JA-5305, ESD-TR-85-059
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in Physical Review B, v25 n6 p4002-4018, 15 Mar 82.

Two theoretical descriptions have been developed for the phase-boundary dynamics during crystallization of amorphus films by scanning with the slit image of a cw energy beam. The first reduces the problem to the solution of one-dimensional integral equation, which allows a choice of initial conditions. Depending on the background temperature, numerical solutions yield either periodic or runaway motion of the amorphous-crystalline (a-c) boundary, as observed in experiments on scanned laser crystallization of thin films of a-Ge on fused-silica substrates. The calculations give a semi-quantitative fit to the experimental results for the spatial periodicity observed in the crystallized films as a function of distance from the laser image at successive times have been computed for both the periodic and runaway cases. The model qualitatively explains many of the effects observed during scanned cw laser crystallization, including periodic fluctuations in light emission. The second theoretical description is more of exact two-dimensional treatment applicable only to cases of steady-state motion of the a-c boundary, which can rigorously handle heat flow in the substrate. This treatment has been used to calculate the boundary velocity during steady-state runaway.

536,720
AD-A153 739/8/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Advances in LEC (Liquid-Encapsulated Czochralski) Growth of InP Crystals.
Journal article,
G. W. Iseler. Nov 84, 25p JA-5623, ESD-TR-85-177
Contract F19628-80-C-0002
Pub. in Jnl. of Electronic Materials, v13 n6 p989-1011 Nov 84.

By reducing the temperature gradients in the vicinity of the crystal-metal interface, 35-mm-diameter InP boules with much reduced dislocation densities have been grown by the liquid-encapsulated Czochralski technique. A reduction in the residual donor concentration of InP grown by this technique has been achieved by using In-rich charges prepared by adding elemental In to polycrystalline InP ingot material. Nominally undoped crystals with carrier concentrations as low as 1-2 x 10 to the 15th power/cc and 77 K mobilities as high as 70,000/sq cm/v/s have been obtained. By growing doped crystals at increased seed or crucible rotation rates, short-range longitudinal variations in dopant concentration have been reduced to a few per cent, as determined by optical absorption measurements with a scanning CO2 laser.

536,721
AD-A153 742/2/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Lateral Epitaxial Overgrowth of Silicon on SiO2.
Journal article,
D. D. Rathman, D. J. Silversmith, and J. A. Burns. Oct 82, 5p JA-5317, ESD-TR-85-064
Contract F19628-80-C-0002
Pub. in Jnl. of the Electrochemical Society: Solid-State Science and Technology, v129 n12 p2303-2306 Oct 82.

The lateral growth of single crystal Si over the edge of a thin (300A) SiO2 bar structure on a single crystal Si substrate using the reduction of SiH4 has been investigated. Lateral-to-vertical growth ratios much greater than 1 have been achieved for appropriate growth conditions. The observed growth phenomena are attributed to differences between the lateral and vertical partial-pressure gradients of the SiH4 gas. If HCl is added to the gas stream, epitaxial Si can be grown over a thick SiO2 (greater than 1 micrometer) structure. In this case, the lateral-to-vertical growth ratio of epitaxial Si does not exceed 2.

536,722
DE85006967/GAR PC **A02/MF A01**
Argonne National Lab., IL.
Study of the Equilibrium Vacancy Ensemble in Aluminum Using 1D- and 2D-Angular Correlation of Annihilation Radiation.
M. J. Fluss, S. Berko, B. Chakraborty, K. R. Hoffmann, and P. Lippel. 12 Mar 85, 5p UCRL-92349, CONF-850169-2
Contract W-7405-ENG-48
International conference on positron annihilation, New Delhi, India, 6 Jan 1985.

One- and two-dimensional angular correlation of positron-electron annihilation radiation (1D and 2D-ACAR) data have been obtained between 293 and 903 K for single crystals of aluminum. The peak counting rates vs temperature, which were measured using the 1D-ACAR technique, provide a model independent value for the temperature dependence of the positron trapping probability. Using these results it is possible to strip out the Bloch state contribution from the observed 2D-ACAR surfaces and then compare the resulting defect ACAR surfaces to calculated 2D-ACAR surfaces for positrons annihilating from the Bloch, monovacancy, and divacancy-trapped states. The result of this comparison is that the presence of an increasing equilibrium divacancy population is consistent with the observed temperature dependence of ACAR data at high temperature in Al and that the present results when compared to earlier studies on Al indicate that the ratio of the trapping rates at divacancies and monovacancies is of order two. (ERA citation 10:022851)

536,723
DE85700319/GAR PC **A03/MF A01**
National Lab. for High Energy Physics, Oho (Japan).
Proceedings of the Meeting on Synchrotron Radiation X-Ray Scattering Study of Nonequilibrium Systems.
Y. Fujii, and T. Matsushita. Apr 83, 37p KEK-83-2, CONF-8311225-
In Japanese.Meeting on synchrotron radiation x-ray scattering study of nonequilibrium systems, Oho, Ibaraki, Japan, 25 Nov 1983.
U.S. Sales Only.

This meeting was held at the Photon Factory on November 25, 1982, in order to investigate the utilization of the special capability of synchrotron radiation X-ray for studying non-equilibrium phase transition. The program of the meeting was as follows. 1) Introductory speech. 2) Current status of the Photon Factory. 3) Morphological transition and roughening transition of growing patterns and crystal growth. 4) Raman scattering study of photo-induced crystallization in semiconductive glass. 5) Neutron scattering study of ordering process in low dimensional magnets. 6) In situ X-ray scattering study of staging transition in graphite intercalation compounds. 7) Tour to the Photon Factory. 8) Pulsed X-ray scattering study of dynamics of non-equilibrium phase transition. 9) Dynamical structure analysis of non-equilibrium phase transition. 10) Neutron scattering study of non-equilibrium systems. 11) Very high resolution X-ray experiment in energy, momentum and time. 12) General discussion and summarization. (Atomindex citation 16:000422)

536,724
DE85700496/GAR PC **A03/MF A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
First- and Second-Neighbor Square Lattice Potts Model: Renormalization Group Treatment.
P. M. C. de Oliveira, C. Tsallis, and G. Schwaccheim. 1982, 28p CBPF-NF-033/82
U.S. Sales Only.

Within a real space renormalization group framework, the q-state Potts model in square lattice assuming positive second-neighbor coupling constant and arbitrary sign for the first-neighbor one is studied. The q-evolution of the full phase diagram as well as the thermal and magnetic critical exponents is obtained. Whenever comparison with available results is possible, the agreement is either exact or very satisfactory. (Atomindex citation 16:007873)

536,725
DE85700499/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Overblocking Effect for 2-Spin Interactions in Some 3-Dimensional Structure.
H. Nencka-Ficek. Jul 84, 18p IC-84/83
U.S. Sales Only.

The overblocking effect is considered. The 3-dimensional structure on which the effect can arise is presented. (Atomindex citation 16:007878)

536,726
DE85700500/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Topological Closure as the Necessary Condition for Frustration and Phase Transitions.
H. Nencka-Ficek. Jul 84, 10p IC-84/96
U.S. Sales Only.

It is shown that the same necessary conditions are necessary both for the frustration and the phase transition in the Ising models with multi-spin interactions. (Atomindex citation 16:007879)

536,727
DE85700501/GAR PC **A04/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Introduction to the Critical and Multicritical Phenomena.
S. R. A. Salinas. Sep 82, 71p IFUSP-P-358
In Portuguese.
U.S. Sales Only.

The behavior of matter in the neighborhood of simple critical points is treated. The concepts of critical exponents and universality is introduced and the classical theories of the critical behavior and the phenomenological scaling theories of the thermodynamic functions and the critical correlations are described. Finally, a description of the theory of the renormalization group, which gives the microscopic bases of the scaling laws is ended. Four types of multicritical points which have already been detected in solid crystals tricritical, bicritical, tetracritical, and Lifshitz points are studied. Landa's theory and the formulation of the scaling laws in the neighborhood of these points is described. Also, the main features of some theoretical models which produce multicritical points-the Ising metamagnet and BEG model, which exhibit tricritical points, and the ANNNI model, which exhibits a Lifshitz point are described. The renormalization group approach in the Fourier space to the Ising metamagnet, and the new techniques of partial differential aproximants to analyze the scaling behavior in the neighborhood of the multicritical points are presented. (Atomindex citation 16:007880)

536,728
DE85700510/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Channelling Radiation and Applications to Defects in Solids.
A. P. Pathak. Jun 84, 7p IC-84/59
U.S. Sales Only.

Using one and two-dimensional hydrogen atom models (with quantum defect corrections) for planar and axial channelling of electrons and harmonic oscillator models in one and two-dimensions for planar and axial cases (with anharmonicity corrections) for positron channelling, some analytical results have been obtained for channelling radiation frequencies. The effects of extended defects (like dislocations) are then considered qualitatively. Some quantitative results are also obtained. (Atomindex citation 16:007922)

536,729
DE85780740/GAR PC **A05/MF A01**
Hanover Univ. (Germany, F.R.). Fachbereich Chemie.
Quasi-Elastic Scattering of Cold Neutrons at Monocrystals of High-Temperature Phases of AgI and Ag sub 2 Se.
Diss. (Dr.rer.nat.),
A. Hoech. 1 Jul 83, 88p INIS-mf-9233
In German.
U.S. Sales Only.

The diffusion of silver ions in alpha -AgI and alpha -Ag sub 2 Se was studied by quasi-elastic scattering of cold neutrons. For that the monocrystals, grown by the Bridgeman-method from the melt, were kept always in high-temperature phase. After determination of crystal orientations time-of-flight spectra for 7 different orientations were recorded. For both materials the quasi-elastic spectrum consists of two parts of different width which can be attached to the diffusive and the local motion component. The narrow quasi-elastic component of alpha -AgI is very anisotropic. This can be explained by a model of an enhanced jumping back

probability of jumps over succeeding tetrahedral sites. In the spectrum of alpha -Ag sub 2 Se both parts are nearly isotropic. Consistently to structure studies this points to the lack of marked sites of the silver ions. The translational motion is explained by a diffusion model along to (100)-directions. The local part is described by an isotropic local diffusion model. (Atomindex citation 16:000420)

536,730
PATENT-4 504 329 Not available NTIS
Department of the Air Force, Washington, DC.
Process for the Epitaxial Deposition of III-V Compounds Utilizing a Binary Alloy as the Metallic Source.
Patent.
K. P. Quinlan, and T. E. Erstfeld. Filed 6 Oct 83, patented 12 Mar 85, 6p AD-D011 663/2, PAT-APPL-6-539 603
Supersedes PAT-APPL-6-539 603, AD-D011 097.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

This patent provides for the deposition of group III-V ternary epitaxial films onto the surfaces of suitable semiconductor substrates. The deposition is accomplished by a vapor phase epitaxy-hydride technique using a group III binary alloy as a group III metal source and phosphine, arsine or stibine as a group V hydride source.

20C. Electricity and Magnetism

536,731
AD-A153 611/9/GAR PC **A04**/MF **A01**
Ohio State Univ., Columbus. ElectroScience Lab.
K-Pulse and Response Waveforms for Non-Uniform Transmission Lines.
Technical rept.,
E. M. Kennaugh, D. L. Moffatt, and N. Wang. Oct 84, 54p Rept no. ESL-712691-1
Contract N00014-78-C-0049

Application of the K-pulse concept to a class of distributed-parameter systems which can be modelled by finite lengths of non-uniform transmission lines is demonstrated in this paper. The K-pulse of such a system is the excitation (input) waveform of finite duration which yields response waveforms of finite duration at all points of the system. Numerical techniques using a finite element method are developed to derive accurate approximation of the K-pulse and response waveforms for uniform and non-uniform transmission lines. Comparison is made with exact results to illustrate the accuracy and utility of the method. (Author)

536,732
AD-A153 809/9/GAR PC **A02**/MF **A01**
Ohio State Univ., Columbus. ElectroScience Lab.
K-Pulse for a Thin Circular Loop.
Technical rept.,
H. T. Kim, N. Wang, and D. L. Moffatt. Mar 85, 25p Rept no. ESL-712691-2
Contract N00014-78-C-0049

Based on the pole-elimination concept, a time-limited input waveform, the K-pulse, is obtained for a thin conducting circular loop. The resultant response waveforms are also found to be time-limited. Therefore, by employing the K-pulse input waveform, the resonant ringing associated with the circular loop has been eliminated. The concept and procedure for deriving the K-pulse are discussed in this paper. (Author)

536,733
AD-A153 923/8/GAR PC **A03**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Potential and Field Fluctuations in Classical Charged Systems,
J. L. Lebowitz, and P. A. Martin. 1984, 27p AFOSR-TR-85-0355
Grant AFOSR-82-0016
Pub. in Jnl. of Statistical Physics, v34 nos1/2 p287-311 1984.

Using electrostatic identities the potential and microfield in a plasma, important for determining line shapes, are expressed as limits of local quantities. These are shown to be well defined for typical configurations of macroscopic, i.e., infinite systems (under some mild clustering assumptions). Their covariance contains a slowly decaying part, (for the potential) whose coefficient is universal whenever the Stillinger-Lovett second moment condition holds. We show further that the contributions from distance regions (which are equal to suitable averages over local regions) have a Gaussian distribution.

536,734
AD-A153 939/4/GAR PC **A04**/MF **A01**
University Coll. of North Wales, Bangor. Dept. of Physics.
Evaluation and Preparation of Ferromagnetic Liquid Composites for Use at Millimeter Wavelengths.
Annual technical rept. no. 1, Oct 83-Oct 84,
J. Popplewell, K. O'Grady, J. P. Llewellyn, and P. Davies. Oct 84, 68p R/D-4130-R-MS
Contract DAJA45-83-C-0026

Magnetic materials consisting of ferrofluids and ferrofluid composites i.e. mixtures of ferrofluid with metallic tin or non-metallic polystyrene or glass particles (0.2 micron to 25 micron diameter) have been prepared and studied. The samples in the form of thin films 1 to 10 micron thick have been examined using magnetic measurements and optical and microwave techniques. The measurements indicate that the films have (1) a magnetic anisotropy with a 30% reduction in magnetization with the plane of the film perpendicular to the field direction (2) a birefringence at both optical and microwave frequencies. Particle conformations in the presence of a magnetic field have also been studied and related to theory which gives the effective diamagnetic magnetic moment/particle approx. = 10 to the minus 9th - 10 to the minus 10th power emu.

536,735
DE85780456/GAR PC **A07**/MF **A01**
European Organization for Nuclear Research, Geneva (Switzerland).
Drift and Diffusion of Electrons in Gases: A Compilation. With an Introduction to the Use of Computing Programs.
A. Peisert, and F. Sauli. 13 Jul 84, 130p CERN-84-08
U.S. Sales Only.

This report is organized in two sections. The first contains an elementary introduction to the theory of electron transport in gases under the action of electric and magnetic fields, and gives indications on the use of two programs to compute drift and diffusion properties of electrons in gas mixtures. The second section contains an extensive collection of experimental and computed data on electron drift velocity and diffusion, as a function of electric field; an index allows one to find the data referring to any given gas mixture. (Atomindex citation 15:073101)

20D. Fluid Mechanics

536,736
AD-A153 503/8/GAR PC **A03**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Singularity Solutions for Ellipsoids in Low-Reynolds-Number Flows: with Applications to the Calculation of Hydrodynamic Interactions in Suspensions of Ellipsoids.
Technical summary rept.,
S. Kim. Feb 85, 44p Rept no. MRC-TSR-2790
Contract DAAG29-80-C-0041, Grant NSF-CPE84-04451
Sponsored in part by Grant NSF-DMS8210950

The disturbance velocity fields due to translational and rotational motions of an ellipsoid in a uniform stream, constant vorticity and constant rate-of-strain, required in fundamental studies of behavior of suspensions, have been obtained by the singularity method. These solutions extend earlier solutions for prolate spheroids. Although equivalent solutions were obtained by Oberbeck (1876), Edwardes (1892) and Jeffery (1922) by separation of variable in ellipsoidal coordinates, the singularity solutions are far more simple in form. Other significant results obtained by the singularity method include the exposition of the unified structure shared by the three boundary value problems and the construction of new forms of the Faxen laws for ellipsoids through application of the reciprocal theorem. The disturbance solutions and Faxen laws, the basis for Smoluchowski's (1911) method-of-reflections technique, are used to calculate hydrodynamic interactions between two or more arbitrarily oriented ellipsoids. In particular, mobility problems are solved directly to order R-5, where R is the centroid-to-centroid separation between the ellipsiods.

536,737
AD-A153 532/7/GAR PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Instability at the Interface between Two Shearing Fluids in a Channel.
Technical summary rept.,
Y. Renardy. Feb 85, 20p Rept no. MRC-TSR-2787
Contract DAAG29-80-C-0041

We consider the linear stability Couette flow composed of two immiscible fluids in layers. The fluids have different viscosities but the same densities. It is known that the short wavelength asymptotics of the interfacial mode for the bounded and unbounded problems are identical. In this paper, we show that there is a critical Reynolds number above which the interfacial modes of the unbounded problem are approximated by those of the bounded problem for wavelengths outside the asymptotic short wavelength range. A full linear analysis reveals unstable situations missed out by the long and short wavelength asymptotic analyses but which have comparable orders of magnitudes for the growth rates. The inclusion of a density difference as well as a viscosity difference is discussed. In particular, the arrangement with the heavier fluid on top can be linearly stable in the presence of gravity if the viscosity stratification, volume ratio, surface tension, Reynolds number and Froude number are favorable.

536,738
AD-A153 533/5/GAR PC **A05**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Hyperbolic Phenomena in the Flow of Viscoelastic Fluids.
Technical summary rept.,
D. D. Joseph. Jan 85, 93p Rept no. MRC-TSR-2782
Contracts DAAG29-80-C-0041, DAAG29-82-K-0051

This paper treats the problem of hyperbolicity, change of type and nonlinear wave propagation in the flow of viscoelastic fluids. Rate equations for fluids with and without instantaneous elasticity are derived and discussed. The equations of fluids with instantaneous elasticity are hyperbolic in unsteady flow and can change type in steady flow. The wave speeds depend on velocities and stresses. Some estimates of wave speeds into states of rest are given. For many of the popular models of fluids the vorticity is the field variable which changes type. The vorticity of all fluids with instantaneous elasticity can change type in motions which perturb rigid ones. Experiments and analysis exhibiting vorticity of changing type are exhibited. The linearized viscoelastic problem is governed by equations having the properties of a telegraph equation. The damping is small when the fluid is very elastic. Elastic fluids have a long memory, a large time (Weissenberg number) for relaxation. The damping is rapid when the relaxation time is small even when the flow is very supercritical. It is shown that steady flow around a body is of 'transonic' type. The linearized problem for flow over a flat plate is reduced to an integral equation for the vorticity distribution on the plate.

536,739
AD-A153 570/7 Not available NTIS
Minnesota Univ., Minneapolis. Dept. of Aerospace Engineering and Mechanics.
Interfacial Shapes between Two Superimposed Rotating Simple Fluids,
H. A. Tieu, D. D. Joseph, and G. S. Beavers. 1984, 62p AEM-R-84-9, ARO-16878.18-MA
Contract DAAG29-82-K-0051
Availability: Pub. in Jnl. of Fluid Mechanics, v145 p11-70 1984 (No copies furnished by DTIC/NTIS).

The interfacial shape of two immiscible simple fluids in a vertical cylinder which oscillates about its axis is investigated using the theory of domain perturbations. The perturbation stresses are expressed by integrals over the history of the deformation. At first order the azimuthal velocity field satisfies the requirements of continuity in velocity and shear stresses across the

interface. At second order the solution consists of a mean part and a time-periodic part varying at twice the frequency of the cylinder. The mean problem is inverted for the mean secondary flow, pressure and interfacial shape. Experimental data for two polymeric oils (TLA227 and STP) show qualitative agreement with theoretical predictions for the mean interfacial shapes.

536,740
AD-A153 581/4 Not available NTIS
Minnesota Univ., Minneapolis. Dept. of Aerospace Engineering and Mechanics.
Climbing Constants for Various Liquids.
D. D. Joseph, G. S. Beavers, A. Cers, C. Dewald, and A. Hoger. 1984, 23p AEM-R-84-8, ARO-18878.16-MA
Contract DAAG29-82-K-0051
Availability: Pub. in Jnl. of Rheology, v28 n4 p325-345 1984 (No copies furnished by DTIC/NTIS).

This reprint presents tables of values of the climbing constant beta = 3 alpha 1 + 2 alpha 2 where alpha 1 and alpha 2 are the parameters of the second-order approximation to the stress in a slow, slowly varying flow of any simple non-Newtonian fluid. The parameter beta arises in the analysis of rod climbing, and it is proportional to the height of the climb in slow steady flow. A method is presented for computing the first normal stress difference and the extensional viscosity at low rates of deformation, using beta alone. This method is useful for all fluids whose unknown second normal stress is nonpositive at low rates of shearing.

536,741
AD-A153 637/4/GAR PC **A02/MF A01**
California Univ., San Diego, La Jolla. Inst. of Geophysics and Planetary Physics.
Parametrically Excited Solitary Waves,
J. W. Miles. 1984, 10p
Grant NSF-OCE81-17539
Pub. in Jnl. of Fluid Mechanics, v148 p451-460 1984.

The following investigation was stimulated by an observation of a standing solitary wave in a long channel subjected to either a vertical oscillation at a frequency of about twice the natural frequency of the dominant cross-wave or a lateral oscillation at a frequency approximately equal to the natural frequency. This standing wave appears to be related to the trapped cross-waves that sometimes appear in front of a wavemaker at either the frequency of the wavemaker or half that frequency. The amplitudes were rather large (about 2 cm), and the corresponding lengths were of the order of the channel width, but it appears that waves of smaller amplitude should be correspondingly longer and may be regarded as slowly modulated, nonlinear cross-waves. I consider here the case of parametric (vertical) excitation. I was first led to reinvestigate the problem of Faraday resonance, for which standing waves are parametrically excited in a basin that is subjected to a vertical oscillation at approximately twice the natural frequency of a particular mode.

536,742
AD-A153 651/5/GAR PC **A03/MF A01**
Dynamics Technology, Inc., Torrance, CA.
Origin of Streamwise Vortices in a Turbulent Boundary Layer.
Final rept.
P. S. Jang, D. J. Benny, and R. L. Gran. Mar 85, 34p Rept no. DT-8154-06
Contract N00014-81-C-0440

Several experiments have suggested that the streamwise vortices, with their accompanying low momentum streaks, in a turbulent boundary layer have a characteristic spanwise wavelength of approximately lambda (superscript + subscript z) = 100. A mechanism is proposed which selects a comparable spanwise wavelength and produces counterrotating streamwise vortices in a turbulent boundary layer. Examining the equations which describe the small deviation of the velocity field from its time-average, it is found that the Benney-Gustavsson resonance (Studies in Applied Mathematics 3, 1981) occurs with such a boundary layer velocity profile. It is shown that, as an integral part of this resonance, there is a mean secondary flow which has a spanwise wavelength lambda (superscript +, subscript z) = 90 and whose velocities exhibit a counter-rotating streamwise vortex structure.

536,743
AD-A153 738/0/GAR PC **A02/MF A01**
California Univ., San Diego, La Jolla. Inst. of Geophysics and Planetary Physics.
Resonantly Forced Surface Waves in a Circular Cylinder,
J. W. Miles. 1984, 17p
Grant NSF-OCE81-17539
Pub. in Jnl. of Fluid Mechanics, v149 p15-31 1984.

The weakly nonlinear, weakly damped response of the free surface of a liquid in a vertical circular cylinder that is subjected to a simple harmonic, horizontal translation is examined by extending the corresponding analysis for free oscillations. The problem is characterized by three parameters, alpha, beta and d/a, which measure damping, frequency offset (driving frequency-natural frequency), and depth/radius. The asymptotic response may be any of: (1) harmonic (at the driving frequency) with a nodal line transverse to the plane of excitation (planar harmonic); (2) harmonic with a rotating nodal line (non-planar harmonic); (3) a periodically modulated sinusoid (limit cycle); (4)a chaotically modulated sinusoid. It appears, from numerical integration of the evolution equations, that only notions of type (1) and (2) are possible if 0.30 < d/a < 0.50, but that motions of type (3) and (4) are possible for all other d/a in some interval (or intervals) of beta if alpha is sufficiently small. Only motion of type (1) is possible if alpha exceeds a critical value that depends on d/a.

536,744
AD-A153 749/7 Not available NTIS
California Inst. of Tech., Pasadena.
Effects of Periodic Forcing on Mixing in Turbulent Shear Layers and Wakes,
F. A. Roberts, and A. Roshko. 14 Mar 85, 10p Rept no. AIAA-85-0570
Availability: Pub. in AIAA Shear Flow Control Conference, 12-14 Mar 85 (No copies furnished by DTIC/NTIS).

The effects of a periodic disturbance, applied to the one of the free streams, on large-scale structure and mixing processes in chemically reacting shear layers and wakes were investigated over a range of Reynolds numbers above and below the mixing transition range. Two different methods were employed to measure the amount of chemical product and thus the extent of molecular-scale mixing. Absorption by reacted phenolphthalein provided cross-stream average product thickness and laser induced fluorescence intensity provided the product concentration distribution. These methods provided, in addition, effective flow visualization of the large-scale structures and of their response to the periodic forcing. The detailed effects of periodic forcing on distribution of mixing along a free shear layer are complex, but the predominant, overall effect is to increase mixing at low Reynolds number (in respect to the mixing transition) and to decrease it at high Reynolds number.

536,745
AD-A153 776/0/GAR PC **A05/MF A01**
Naval Research Lab., Washington, DC.
Turbulent Wake of a Submerged Flat Plate.
Memorandum rept. Nov 81-Nov 84,
A. L. Cooper. 11 Apr 85, 97p Rept no. NRL-MR-5521

The turbulent wake of a two-dimensional, submerged flat plate is calculated by means of a parabolic, two-equation, k-epsilon model. The general turbulence model considered involves standard k and epsilon equations and possess the capability for free-surface proximity effect terms through an algebraic stress model for the Reynolds stress equation. This type of model along with an enhanced Dirichlet type boundary condition for the dissipation at the free surface has been successful in applications to open channel flow but it is found to be unsatisfactory for the submerged wake application. Both the proximity terms and the enhanced dissipation boundary condition lead to reduced wake drag when compared with recent experiments. A standard k-epsilon eddy viscosity model with adjusted model parameters and symmetric boundary conditions at the free-surface best describes the wake application. Model parameter sets for application to deep and shallow submerged wakes are optimized by comparing the predictions with the recent experiments of Swean and Keramidas. A parameter set with enhanced epsilon diffusivity and retarded k diffusivity seems to provide best agreement with the experimental profiles. The systematic wake drift toward the free-surface which has been observed experimentally is not predicted although excellent agreement is obtained when the predicted profiles are shifted in accordance with the experimental drift observations.

536,746
AD-A153 806/5/GAR PC **A03/MF A01**
Johns Hopkins Univ., Baltimore, MD. Dept. of Earth and Planetary Sciences.
Nature of the Entrainment Interface of a Two-Layer Fluid Subjected to Zero-Mean-Shear Turbulence,
H. J. S. Fernando, and R. R. Long. 1985, 33p
Contract N00014-76-C-0184, Grant NSF-ATM79-07026
Pub. in Jnl. of Fluid Mechanics, v151 p21-53 1985.

An experimental study was performed to further understanding of turbulent mixing in a two-layer fluid subjected to shear-free turbulence. At low Richardson numbers the entrainment seems to occur through the eroding effect of large eddies, whereas at high Ri the large eddies flatten at the density interface and the quasi-isotropic eddies near the interface are responsible for the entrainment. The buoyancy transfer can be well described by a gradient-transport model when the eddy diffusivity is properly defined. At or just above the entrainment interface, the buoyancy flux is of the same order as the dissipation, and the diffusive-flux Richardson number tends to a constant. The thickness h of the interfacial layer was measured in three different ways and was found to grow linearly with the depth of the mixed layer, in agreement with preliminary findings. The buoyancy gradient in the interfacial layer was found to be constant, and the resulting buoyancy conservation law was experimentally verified.

536,747
AD-A153 849/5/GAR PC **A02/MF A01**
Naval Research Lab., Washington, DC.
Hydrosyncisstic Infundibulum.
Memorandum rept.,
D. L. Brook. 29 Apr 85, 14p Rept no. NRL-MR-5569

The possibility of setting up a water vortex inside a convergent axisymetric duct is investigated, with a view toward applications to a proposed high-density-gas-enclosed Z-pinch experiment.

536,748
AD-A153 858/6/GAR PC **A03/MF A01**
Dynamics Technology, Inc., Torrance, CA.
Displacements Generated by a Pressure-Point Advected Across the Surface of a Viscoelastic Material.
Interim technical rept. Jan-Oct 83,
V. D. Panico, and T. Kubota. Oct 83, 42p Rept no. DT-8154-05
Contract N00014-81-C-0440

The possibility of reducing ther drag of an underwater vehicle by the use of a compliant coating has given rule to several theoretical and experimental efforts. In a recent experiment in whicxh water flowed over the surface of a visoelastic material, the most prominent surface deformations that were observed were streamwise streaks, or ruts, aligned with the flow. This report treats an idealized problem which is designed to help in understanding the possible source of th ese streaks. The results of this work indicate that the streak pattern most likely consists of the footprints of turbulent bursts in the boundary layer as the bursts are advected across the surface of the material. It was found that the surface waves generated by these bursts are quite negligible.

536,749
AD-A153 924/6/GAR PC **A12/MF A01**
Dayton Univ., OH. Research Inst.
Method of Residual Minimization in Compressible Steady Flows.
Interim rept. Mar 83-Jun 84,
K. G. Guderley. Apr 85, 255p UDR-TR-84-46, AFWAL-TR-85-3002
Contract F33615-83-K-3207

Theoretical aspects of residual minimization in transonic flows are discussed for different formulations of the basic equations. By a special choice of the metric in function space, one de-emphasizes short wave errors which are technically less important but cause slow convergence. Far field conditions are included in the approach by considering the distant (noncomputed) flow field as a superelement characterized by shape functions which solve the linearized equations. The matching of the three dimensions between the distant flow field and the computer part poses a difficult problem. A simple example shows a rather strong propagation of matching errors. Wake capturing can be accomplished even if one retains in nearly all of the flow field the idea of a potential flow. Linearized exam-

ples for supersonic problems give some insight in the questions of stability and accuracy.

536,750
AD-A153 982/4/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
Interfacial Solitary Waves Over Slowly Varying Topography,
K. R. Helfrich, W. K. Melville, and J. W. Miles. 1984, 13p
Pub. in Jnl. of Fluid Mechanics, v149 p305-317 1984.

The propagation of long, weakly nonlinear interfacial waves in a two-layer fluid of slowly varying depth is studied. The governing equations are formulated to include cubic nonlinearity, which dominates quadratic nonlinearity in some parametric neighbourhood of equal layers depths. Numerical solutions are obtained for an initial profile corresponding to either a single solitary wave or an rank-ordered pair of such waves incident in a monotonic transition between two regions of constant depth. The numerical solutions, supplemented by inverse-scattering theory, are used to investigate the change of polarity of the incident waves as they pass through a 'turning point' of approximately equal layer depths.

536,751
AD-A153 984/0/GAR PC **A02/MF A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Experimental Study of the Spray Characteristics of a Research Airblast Atomizer.
Technical memo.,
W. A. Acosta. 1985, 16p NASA-E-2404, NASA-TM-86911, USAAVSCOM-TR-84-C-18

An experimental study of airblast atomization was conducted using an especially designed atomizer in which the liquid first impinges on a splash plate, then is directed radially outward and is atomized by the air passing through two concentric, vaned swirlers that swirl the air in opposite directions. The effect of flow condition, air mass velocity (mass flow rate per unit area, rho sub A, U sub A and liquid to air ratio on the mean drop size was studied. Seven different ethanol solutions were used to simulate changes in fuel physical properties. The range of atomizing air velocities was from 30 to 80 m/s. The mean drop diameter was measured at ambient temperature (295 K) and atmospheric pressure.

536,752
DE85009578/GAR PC **A02/MF A01**
Los Alamos National Lab., NM.
Pattern Selection and Instability in Nonlinear Wave Equation: An Aspect of Soliton and Chaos.
M. Imada. 1985, 6p LA-UR-85-848, CONF-850165-2
Contract W-7405-ENG-36
Conference on solitons and coherent structures, Santa Barbara, CA, USA, 11 Jan 1985.

Pattern selection problems are found in a variety of phenomena. Fluid dynamical systems and nonlinear diffusion phenomena give typical examples of pattern formation problems in dissipative systems. In some cases the dissipation reduces the effective dimension of the system, and this fact leads to several strikingly universal behaviors which were initially found in simple model systems with a few degrees of freedom. Nonlinear wave equations themselves, however, describes systems without dissipation in which the situation is more complicated. In spite of this complexity, many completely integrable systems are known in nonlinear wave equations, where neither ergodicity nor chaos is expected. With addition of small perturbation to completely integrable systems, one can see the growth of instability and the role of coherent structures in the pattern selection problem. Two aspects are briefly discussed in the following sections. (ERA citation 10:023225)

536,753
PB85-186146/GAR PC **E03/MF E03**
Central Electricity Generating Board, Southampton (England). Technology Planning and Research Div.
Forces on the Vibating Centrebody of an Annular Diffuser,
A. Spurr, and D. E. Hobson. c1985, 20p TPRD/M/1470/N85
Presented at ASME Multidivisional Symposium on Flow-Induced Vibration at New Orleans on December 1984.

The unsteady forces caused by the flow down an annulus formed between a fixed outer cylinder and a vibrating centerbody have been measured over a range of frequencies. It is found that the forces are particularly sensitive to the amount of pressure recovery which takes place when the annulus is terminated in an annular diffuser and that high recovery leads to forces on the centerbody which are in phase with centerbody velocity and therefore likely to lead to coupled fluid/structure self-excited vibrations. The measurements are compared with forces predicted using a small perturbation analysis of the flow in the annulus in which dynamic effects arise from movement of the fluid displaced by the centerbody, and where the upstream and downstream boundary conditions are derived using a quasi-steady linearization of the steady flow relationships there.

20E. Masers and Lasers

536,754
AD-A153 410/6 Not available NTIS
Duke Univ., Durham, NC. Dept. of Physics.
Excitation, Inversion, and Relaxation Mechanisms of the HCN FIR Discharge Laser,
D. D. Skatrud, and F. C. De Lucia. 1984, 16p ARO-19977.8-PH
Contract DAAG29-83-K-0078
Availability: Pub. in Applied Physics B, v35 p179-193 1984 (No copies furnished by DTIC/NTIS).

Millimeter/submillimeter rotational absorption spectroscopy has been used as a diagnosis probe of a cw HCN discharge laser. This sensitive technique allowed in situ absolute population measurements of a number of vibrational states of HCN (including the upper lasing state) and other pertinent molecules. This unique set of data, which was obtained under a variety of discharge and laser conditions, is directly related to excitation, inversion, and relaxation processes. Along with elucidating several fundamental aspects of inversion and relaxation these results also strongly indicate that the primary laser excitation mechanism is near-resonant energy transfer from vibrationally excited nitrogen, N2 (v=1), to the fundamental symmetric stretching mode of hydrogen cyanide, HCN (100), and subsequent thermal population exchange between HCN (100), and the upper laser state, HCN (110).

536,755
AD-A153 424/7/GAR PC **A03/MF A01**
Hampton Inst., VA. Dept. of Physics and Engineering Studies.
Intense Excitation Source for High Power Laser.
Final rept. 26 Sep 83-25 Dec 84,
K. S. Han. 25 Feb 85, 33p ARO-20922.3-PH-H
Grant DAAG29-83-G-0107

A high power blue-green dye laser has been pumped with an array of multiple-stage hypocycloidal-pinch (HCP) plasmas. The maximum untuned laser power obtained with LD490 dye exceeded 230kW with a pulse width of 1.0 microseconds (FWHM). The HCP pump source was energized by up to 4.2 kJ energy which was stored in the capacitor bank. The plasms temperature 7,250 K was obtained when the HCP was operated for the optimum laser output, The spectral efficiency of the absorbed radiation was 22% or 83% of the maximum efficiency of the optimum blackbody source. Finally the enhancement of LD490 dye laser output energy has been attemped with the spectrum conversion of HCP pumping light, The result indicates that the secondary dye BBQ enhanced laser output of LD490 dye by a factor of two.

536,756
AD-A153 568/1/GAR PC **A02/MF A01**
Lasertron, Inc., Burlington, MA.
1.5 Micrometer GaInAsP High Pulsed Power Diode Lasers.
Final rept. 15 Sep 81-31 Dec 84,
J. J. Hsieh. 4 Mar 85, 6p ARO-18450.1-PH-S
Contract DAAG29-81-C-0036

The growth condition for fabricating 1.5 micrometer lasers using LPE techniques has been established. High power performance and external quantum efficiency of the laser are studied.

536,757
AD-A153 714/1/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Status of CO2 Isotope Lasers and Their Applications in Tunable Laser Spectroscopy.
Journal article,
C. Freed. 8 Aug 82, 10p JA-5324, ESD-TR-85-067
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in IEEE Jnl. of Quantum Electronics, vQE-18 n8 p1220-1228, 8 Aug 82.

The use of CO2 isotopes can provide a manifold expansion of the usable frequency range of sealed-off CO2 lasers. Determination of the frequency, gain, and saturation of the various CO2 istopic laser transitions will be discussed. Design considerations for constructing CO2 istopic lasers and selected applications will be presented.

536,758
AD-A153 718/2/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Pulse-Pumped Operation of Divalent Transition-Metal Lasers.
Journal article,
P. F. Moulton. Aug 82, 5p JA-5335, ESD-TR-85-074
Contract F19628-80-C-0002
Pub. in IEEE Jnl. of Quantum Electronics, vQE-18 n8 p1185-1188 Aug 82.

No abstract available.

536,759
AD-A153 723/2/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Output Power and Temperature Dependence of the Linewidth of Single-Frequency cw(GaAl)As Diode Lasers.
Journal article,
D. Welford, and A. Mooradian. 15 May 82, 4p JA-5327, ESD-TR-85-070
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v40 n10 p865-867, 15 May 82.

We report here the observation of a linear dependence of cw single-frequency (GaAl)As diode laser linewidth as a function of reciprocal output power at 77,195, and 273 K. The observed data are explained in terms of spontaneous emission events and their related refractive index perturbations.

536,760
AD-A153 951/9/GAR PC **A05/MF A01**
Toronto Univ., Downsview (Ontario). Inst. for Aerospace Studies.
Application of Laser Resonance Saturation to the Development of Efficient Short Wavelength Lasers.
Final technical rept. 1 Oct 79-31 Oct 84,
R. M. Measures. 31 Oct 84, 84p AFOSR-TR-85-0376
Grant AFOSR-80-0057

Laser saturation of an atomic resonance transition represents an important new mode of coupling laser energy into a gas or plasma. The basic mechanism in either case is superelastic collisional heating of free electrons. For a gas various seed ionization processes precede this interaction. During the past year we have developed a computational code for mapping the three dimensional nature of this interaction. This is required because this strong interaction invariably distorts and attenuates the laser pulse as it propagates through the medium being excited. We have also developed a new experimental facility for studying this interaction and have recently completed our first spectroscopic measurements of the electron temperature produced in a sodium plasma created through laser resonance saturation. This temperature appears to be somewhat lower than predicted by our computer simulation and we are currently attempting to reconcile this difference. Also within the past year we have discovered that attenuation of the laser pulse is a maximum when the laser is detuned by about 0.5 nm from either of the resonance lines.

536,761
PAT-APPL-6-707 294/GAR PC **A02/MF A01**
Department of the Army, Washington, DC.

Simple Power Meter for High Energy Pulsed Lasers.
Patent Application,
C. H. Pyles, and W. F. Otto. Filed 1 Mar 85, 14p AD-D011 661/6
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A temperature resistance wire is wound about a frame and exposed to the laser beam which causes the temperature of the wire to increase. The resistance change of the wire is measured so as to give an indication of the energy of the laser. The wire is wound with a plurality of turns in one direction so as to make the device non-dependent upon the polarization orientation of the laser. (Author)

536,762
PB85-184869/GAR PC E05/MF E05
Electricity Council Research Centre, Capenhurst (England).
Laser Power Transmission in Optical Fibres and the Interaction with Robot Technology for Industrial Use,
J. B. Wareing. Jun 84, 62p ECRC/M-1802

The penetration of laser technology into industry has been increasing in recent years and it now represents a cost-effective alternative in many areas. The use of industrial robots in the U.K. is also increasing rapidly with the numbers nearly doubling annually. The combination of laser power and expertise with robotic control and flexibility is being restricted, however, by the sheer size and immobility of laser equipment. This memorandum looks at the possibilities of using optical fibers to guide high power laser beams and the possible markets that could then be available. It is found that optical fibers transmit well at wavelengths where laser power is restricted (500W in the 1-1.5 micrometer region) and poorly (100W) where ample laser power is available (10.6 micrometer). Current developments in Nb-YAG lasers (at 1.06 micrometers) and fiber optic materials (KRS-5) however, should eliminate this imbalance within a few years.

536,763
PB85-189744/GAR PC E03/MF E03
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Vulcan Pulse Generating System,
C. N. Danson, C. B. Edwards, and R. W. W. Wyatt. c1985, 17p RAL-84-124

During the past two years several changes have been made to the front end system on the Vulcan laser system. These changes give greater flexibility and a wider choice of operating conditions. This note gives an updated description of the system capabilities, and gives users of the facility an idea of the various pulse combinations that are available.

536,764
PB85-861375/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Gas Laser Devices and Systems. 1970-May 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-May 85.
Jun 85, 79p

This bibliography contains citations of selected patents concerning design aspects and apparatus descriptions of gas laser devices and systems. Devices designed for laser gas discharge, excitation, stabilization, and confinement are discussed. Electrical discharge devices, and electron beam excited and sustained gas laser systems are among the equipment types considered. (Contains 97 citations fully indexed and including a title list.)

20F. Optics

536,765
AD-A153 416/3 Not available NTIS
Arizona Univ., Tucson. Optical Sciences Center.
Nonlinear Optical Interferometer,
F. A. Hopf, and M. Cervantes. 15 Feb 82, 12p ARO-15412.31-PH
Contracts F49620-80-C-0022, MIPR-103-83
Availability: Pub. in Applied Optics, v21 n4 p668-677, 15 Feb 82 (No copies furnished by DTIC/NTIS).

The interferometer described, based on the second harmonic generation of light, is useful in the contouring of refractive objects with large variations in optical depth. The device is a real-time common-path self-referencing interferometer that yields interferograms in the visible with an equivalent wavelength of the order of 50 micrometer. We describe experiments that show that it can serve as a useful device. The key to the device is the use of Y-cut LiNbO3 configured for surface acoustooptic applications rather than for conventional second harmonic applications. The crystals are noncritically phase matched by temperature control and are used with a repetitively pulsed Nd:YAG laser operating at 1.06 micrometer.

536,766
AD-A153 417/1 Not available NTIS
Arizona Univ., Tucson. Optical Sciences Center.
Collision Broadening Model for the Biexciton Resonance in CuCl,
N. Peyghambarian, D. Sarid, H. M. Gibbs, L. L. Chase, and A. Mysyrowicz. 15 Feb 84, 5p ARO-15412.22-PH
Contracts F49620-80-C-0022, MIPR-103-83
Availability: Pub. in Optics Communications, v49 n2 p125-128, 15 Feb 84 (No copies furnished by DTIC/NTIS).

It is shown that the cage model of the spectral broadening of the biexciton resonance in CuCl due to collisions is in agreement with experimental results.

536,767
AD-A153 420/5/GAR PC A02/MF A01
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Multiple-Order Radial-Grating Shearing Interferometer.
Journal Article,
P. D. Henshaw, and S. K. Manlief. 15 May 82, 7p JA-5272, ESD-TR-85-050
Contract F19628-80-C-0002
Pub. in Applied Optics, v21 n10 p1772-1777, 15 May 82.

A shearing interferometer suitable for coherent phasing of multiple-aperture optical systems is described. The interferometer uses the properties of a rotating radial square wave grating to simplify interaperture phase measurements, A theoretical development and the results of experiments conducted at a wavelength of 10.6 micrometers are presented.

536,768
AD-A153 428/8 Not available NTIS
California Univ., Irvine. Dept. of Physics.
Second-Harmonic Generation in Reflection from a Metallic Grating,
G. A. Farias, and A. A. Maradudin. 15 Sep 84, 15p ARO-18493.11-PH
Contract DAAG29-82-K-0018
Availability: Pub. in Physical Review B, v30 n6 p3002-3015, 15 Sep 84 (No copies furnished by DTIC/NTIS).

This reprint presents a nonperturbative theory of second-harmonic generation in reflection from a metallic grating. p-polarized light of frequency omega is assumed to be incident on the grating surface from the vacuum side, with the plane of incidence perpendicular to the grooves of the grating. The authors employ the method of reduced Rayleigh equations to solve Maxwell's equations in the presence of a non-linear polarization and calculate diffracted field at the frequency 2 omega. In the vicinity of the frequency where the incident photon couples to surface polaritons on the grating they obtain an enhancement of the second-harmonic intensity by a factor of about 10,000 over its value for a flat surface. The effect of the surface current density in the nonlinear polarization on the enhancement is analyzed. Numerical results are presented for a grating of silver.

536,769
AD-A153 439/5/GAR PC A02/MF A01
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Laser Beamsteering Using the Photorefractive Effect.
Journal article,
P. D. Henshaw. 1 Jul 82, 4p JA-5221, ESD-TR-85-045
Contract F19628-80-C-0002
Pub. in Applied Optics, v21 n13 p2323-2325, 1 Jul 82.

A new configuration for laser beamsteering based on the photorefractive effect is presented. This method has the potential to produce several thousand beam positions, with a random access time of <1 msec. The method has a theoretical efficiency approaching 100%. The principles of device operation are presented, including a writing beam geometry which will allow the efficiency to be maintained over a wide field of view. A scheme for generating the required beams and results of a proof-of-concept experiment are presented.

536,770
AD-A153 501/2 Not available NTIS
Arizona Univ., Tucson. Optical Sciences Center.
Theory of Two-Photon Phase Conjugation,
T. Y. Fu, and M. Sargent, III . Oct 80, 4p ARO-15412.25-PH
Contracts F49620-80-C-0022, MIPR-103-83
Availability: Pub. in Optics Letters, v5 n10 p433-435 Oct 80 (No copies furnished by DTIC/NTIS).

The theory of degenerate four-wave mixing using two-photon transitions is formulated. Two kinds of mechanisms compete in generating conjugate waves leading to two phenomena that do not occur in two-level media: (1) a double-peaked reflection spectrum and (2) coupled-mode oscillation in absorbing media. In addition, because of the dynamic Stark-shifted line center, the reflection coefficient approaches a constant value at large intensities, unlike the two-level coefficient, which bleaches to zero.

536,771
AD-A153 502/0 Not available NTIS
Wisconsin Univ.-Milwaukee.
Real-Time Holographic Interferometry through Fibre Optics,
T. D. Dudderar, and J. A. Gilbert. 1985, 5p ARO-17357.17-EG
Contract DAAG29-80-K-0028
Availability: Pub. in Jnl. of Physics E, v18 p39-43 1985 (No copies furnished by DTIC/NTIS).

Stable, high frequency holographic interference fringes have been recorded on objects illuminated and viewed through fiber optics in real time using a system of singlemode fibre optic illuminators, a multimode fibre optic image bundle and a lensless 'instant' holocamera. This development has great potential for applications in the full-field remote measurement of surface displacements and/or deformations as they occur.

536,772
AD-A153 537/6/GAR PC A02/MF A01
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Monte Carlo Description of Time- and Space-Resolved Multiple Forward Scatter in Natural Water.
R. M. Lerner, and J. D. Summers. 1 Mar 82, 10p JA-5287, ESD-TR-85-053
Contract F19628-80-C-0002
Availability: Pub. in Applied Optics, v21 p861-869, 1 Mar 82.

The universal scatter function for natural water beam spread patterns in multiple forward scatter which remain compact in time and angular subtense, even neglecting absorption. (Author)

536,773
AD-A153 548/3/GAR PC A02/MF A01
California Univ., Irvine. Dept. of Physics.
Theoretical Investigations of the Propagation and Interactions of Surface Waves.
Final rept. 16 Nov 81-15 Nov 84,
A. A. Maradudin. 22 Feb 85, 5p ARO-18493.14-PH
Contract DAAG29-82-K-0018

A research program is proposed for theoretical studies of the propagation and interaction of surface waves. Two types of surface waves will be investigated: surface acoustic waves and surface electromagnetic wave (surface polaritons). The former have important application in devices such as signal processors and the latter in integrated optics. For both types of surface waves theoretical investigation will be made of the reflection and transmission of surface waves at a planar boundary between two material media.

536,774
AD-A153 639/0/GAR PC A02/MF A01
Materials Research Labs., Ascot Vale (Australia).

High-Pressure Optical Cell.
Technical note,
R. McLeary, and A. J. Hutchins. Nov 84, 15p Rept no. MRL-TN-486

This technical note describes a high-pressure optical cell and associated pressurising equipment which have been constructed at MRL. The system provides gas mixtures in the cell at pressures of up to 200 MPa at temperatures in the range 200-300 K. The apparatus was required for an experimental investigation of collision-induced fluorescence and optical gain in optically-pumped gas mixtures at high pressure.

536,775
DE85008649/GAR PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Fiber Optics in High Dose Radiation Fields.
J. K. Partin. 1985, 14p EGG-M-22584, CONF-850345-4
Contract AC07-76ID01570
Southwest conference on optics, Albuquerque, NM, USA, 4 Mar 1985.

A review of the behavior of state-of-the-art optical fiber waveguides in high dose (greater than or equal to 10 exp 5 rad), steady state radiation fields is presented. The influence on radiation-induced transmission loss due to experimental parameters such as dose rate, total dose, irradiation history, temperature, wavelength, and light intensity, for future work in high dose environments are given. (ERA citation 10:021593)

536,776
DE85700504/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Optical Absorption and Electron Spin Resonance in Natural, Irradiated and Heated Spodumene.
A. S. Ito, and S. Isotani. Sep 83, 46p IFUSP-P-429
U.S. Sales Only.

Heat treatment and X and gamma -Rays irradiation of lylac and colorless natural spodumene, LiAlSi sub 2 O sub 6 , have been studied. Irradiation produces a color change, from lylac or colorless to green. Irradiated samples heated at 200 deg C turn lylac and bleach at 400 deg C. Optical absorption spectra were decomposed into gaussian line shape bands and it is observed that green and lylac centers are simultaneously created by irradiation. These centers are independent from each other. Optical absorption, EPR and X-Ray fluorescence results show the spectra of impurities, responsible by the presence of the created centers and indicated Mn participation in the process of centers creation and destruction. Decay kinetics of green and lylac centers have been studied and it is observed that simple kinetic models do not apply to these cases. An empirical fit allowed the calculation of activation energies of the lylac and green centers decays. Discussions about the present results led us to propose a new model where the green and lylac centers are due to Mn exp 3+ ions in two different Al exp 3+ sites, whose absorption are intensified by the interaction with an electron trapped in a neighbour oxygen. (Atomindex citation 16:007883)

536,777
DE85700505/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Optical Absorption in Irradiated Natural Beryl.
S. Isotani, O. L. Dias, and A. R. P. L. Albuquerque. Oct 83, 20p IFUSP-P-436
U.S. Sales Only.

Three species of beryl irradiated with gamma -rays of sup 60 Co were studied by optical absorption. One became yellow and the other two Maxixe's blue. The effects of heat treatments were determined by the thermal isochronal decays of the optical absorption bands. Activation energies and frequency factor were obtained through the first order process kinetic model. Discussions lend us to assign for the UV band-edge the model of absorption by a hole center stabilized by a Fe exp 2+ (substituting Al exp 3+) ion in a neighbour oxygen. (Atomindex citation 16:007884)

536,778
DE85700506/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Comparative Study of Five Varieties of Spodumene Through Optical Absorption.
A. T. Fujii, and S. Isotani. Nov 83, 33p IFUSP-P-437
U.S. Sales Only.

A comparative study of five varieties of spodumene crystals from Brazil through optical absorption spectroscopy, classified according to the colours lylac, colourless I, colourless II, yellow and green is reported. This series shows a consistent increase of the (Fe)/(Mn) ratio. The principal bands in the yellow sample are at 7,000 and 9,000 cm exp -1 , and in the green sample besides these bands a band at 16,000 cm exp -1 is observed. In lylac, colourless I and colourless II samples, the principal bands are at 18,000 cm exp -1 and when irradiated two new bands appears at 15,700 cm exp -1 (E perpendicular to c) and 11,000 cm exp -1 (K perpendicular to c). It is suggested that in green and yellow samples the bands are due to Fe exp 2+ (at 7,000 cm exp -1 and 9,000 cm exp -1) and due to Fe exp 2+ - Fe exp 3+ charge transfer (at 16,000 cm exp -1). In lylac and colourless I samples the model for Mn exp 3+ at two different sites is applied. The colourless II corresponds to the case in which Mn exp 3+ is at one site alone, being prohibited from occupying the second site due to higher Fe concentration. (Atomindex citation 16:007885)

536,779
PATENT-4 497 540 Not available NTIS
National Aeronautics and Space Administration, Pasadena, CA. Pasadena Office.
Optical System.
Patent,
J. B. Breckinridge, N. A. Page, R. V. Shack, and R. R. Shannon. Filed 23 Mar 83, patented 5 Feb 85, 14p N85-23396/3, PAT-APPL-6-478 130
Supersedes PAT-APPL-6-478 130, N83-25541 (21 - 14, p 2320). Sponsored by NASA.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231, $1.00.

Disclosed is an optical system used in a spacecraft to observe a remote surface and provide a spatial and spectral image of this surface. The optical system includes aspheric and spherical mirrors aligned to focus at a first focal plane an image of the surface, and a mirror at this first focal plane which reflects light back on to the spherical mirror. This spherical mirror collimates the light and directs it through a prism which disperses it. The dispersed light is then focused on an array of light responsive elements disposed at a second focal plane. The prism is designed such that it disperses light into components of different wavelengths, with the components of shorter wavelengths being dispersed more than the components of longer wavelengths to present at the second focal plane a distribution pattern in which preselected groupings of the components are dispersed over essentially equal spacing intervals.

536,780
PATENT-4 502 756 Not available NTIS
Department of the Navy, Washington, DC.
Bandpass Filter Formed by Serial Gratings Operating in a Wood's Anomaly Region.
Patent,
P. R. Peterson, and A. Gavrielides. Filed 30 Sep 82, patented 5 Mar 85, 6p AD-D011 660/8, PAT-APPL-6-431 865
Supersedes PAT-APPL-6-431 865, AD-D009 935.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

A bandpass filter is comprised by a plurality of reflection gratings operating in a Wood's anomaly region and arranged in serial relationship. Specifically, the gratings are serially arranged in two substantially parallel rows with the gratings in the first row offset laterally from the gratings in the second row. Further, the input to each grating is at substantially the same angle of incidence such that the output of one grating is the direct input to the next succeeding one of the gratings. (Author)

536,781
PB85-194736/GAR PC **A03**/MF **A01**
National Bureau of Standards (NEL), Boulder, CO. Electromagnetic Technology Div.
Redefining the Scratch Standards,
M. Young, and E. G. Johnson. Feb 85, 28p NBS/TN-1080
Sponsored by Army Armament Research and Development Command, Dover, NJ. Also available from Supt. of Docs as SN003-003-02635-2.

The scratch standard (MIL-0-13830A) is a cosmetic standard that is effected by a visual comparison with a set of submasters that are in turn evaluated by comparison with a set of master standards. Both manufacture and certification of the submasters are somewhat unreliable. In this paper, the authors show that the submasters can be classified according to the relative power scattered at a relatively small angle. They have designed etched gratings with which to replace the submasters; these gratings have the appearance of scratches but diffract a broad peak between 5 and 10 degrees off the axis of the incident beam. The authors have classified some prototypes both by comparison with the master standards and by a photoelectric measurement; agreement between the two methods is good. The authors suggest that such gratings be used as the submasters and possibly that they be classified by a photoelectric rather than visual measurement.

536,782
PB85-195303/GAR PC **A03**/MF **A01**
National Bureau of Standards, Gaithersburg, MD.
Self-Study Manual on Optical Radiation Measurements. Part 1. Concepts. Chapter 12. Blackbodies, Blackbody Radiation, and Temperature Scales.
Technical rept.,
J. C. Richmond, and F. E. Nicodemus. Apr 85, 49p NBS/TN-910-8
See also PB84-218346. Also available from Supt. of Docs as SN003-003-02647-6.

This is the eighth in a series of Technical Notes (910-) entitled 'Self-Study Manual on Optical Radiation Measurements'. It contains Chapter 12 of Part I of this Manual. Additional chapters will continue to be published, similarly, as they are completed. The Manual is a comprehensive tutorial treatment of the measurement of optical radiation that is complete enough for self-instruction. Detailed chapter summaries make it also a convenient authoritative reference source. In this chapter, the authors review the radiometric treatment, and the significance for radiometric measurements, of blackbodies, blackbody radiation, and temperature scales. Many important and interesting aspects are not treated because the authors primary interest is in radiometry and radiometric measurements. The emphasis is on ideal blackbodies and laboratory simulators; thermal radiation from other real sources will be treated in a chapter on Thermal Radiation Properties of Materials.

536,783
PB85-200186/GAR PC **A04**/MF **A01**
National Bureau of Standards (NEL), Gaithersburg, MD. Center for Mfg. Engineering.
Transient Analysis of Electromagnetic Reflection from Dispersive Materials,
A. G. Lieberman. Mar 85, 73p NBS/TN-1202
Also available from Supt. of Docs as SN003-003-02651-4.

Theoretical expressions are presented describing the transient and steady-state temporal evolution of an impulsive, TE-polarized, plane wave reflected into vacuum from any of a variety of frequency-dispersive material surfaces. Polar dielectrics, non-polar dielectrics, metals and plasmas are treated using, respectively, the Debye, Lorentz, and Drude material models to investigate the effects of dispersion upon dimensional measurements performed with optical pulses of extremely short duration. The more general problem, concerning the reflection of an optical pulse of any specified waveform, is resolved by performing a convolution of the incident wave at the material surface with the previously determined reflection of an impulsive wave.

536,784
PB85-861532/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Photoluminescence. June 1976-April 1983 (Citations from the Energy Data Base).
Rept. for Jun 76-Apr 83.
Jun 85, 263p
Prepared in cooperation with Department of Energy, Washington, DC.

This bibliography contains citations concerning photoluminescent properties and spectra of materials used in lasers, solar energy devices, semiconductors, and scintillation counters. Included are examinations of crystal structures and defects, and the effects of temperature on the spectra of photoluminescence. (This updated bibliography contains 234 citations, none of which are new entries to the previous edition.)

536,785
PB85-861540/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Photoluminescence. May 1983-May 1985 (Citations from the Energy Data Base).
Rept. for May 83-May 85.
Jun 85, 150p
Supersedes PB83-862938. Prepared in cooperation with Department of Energy, Washington, DC.

This bibliography contains citations concerning photoluminescent properties and spectra of materials used in lasers, solar energy devices, semiconductors, and scintillation counters. Included are examinations of crystal structures and defects, and the effects of temperature on the spectra of photoluminescence. (This updated bibliography contains 141 citations, all of which are new entries to the previous edition.)

536,786
PB85-861987/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Acoustooptical Laser Modulators and Deflectors. 1970-May 1985 (Citations from the Engineering Index Data Base).
Rept. for 1970-May 85.
Jun 85, 178p
Supersedes PB81-801557.

This bibliography contains citations concerning the theory, design, testing, performance, and applications of acoustooptical devices for laser beam modulation, deflection, splitting, mode locking, and tuning. Included in the cited reports are studies on acoustooptical materials. Applications of the interactions of acoustooptic devices on lasers include optical information processing, optical communications, optical memory devices, switches, scanners, and color television display systems. (This updated bibliography contains 265 citations, 132 of which are new entries to the previous edition.)

536,787
PB85-862100/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Optical Beam Splitters. 1975-May 1985 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Data Base).
Rept. for 1975-May 85.
Jun 85, 203p
Supersedes PB83-868158.

This bibliography contains citations concerning techniques and applications of beam splitters as used in beam optics. Techniques include coatings, mirrors, prisms, gratings, metal films, and thin films. Applications include measuring and monitoring devices, imaging, light amplification, profilometers, interferometry, and optical communications. (This updated bibliography contains 241 citations, 61 of which are new entries to the previous edition.)

536,788
PB85-862167/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Integrated Optics. 1970-June 1985 (Citations from the NTIS Data Base).
Rept. for 1970-Jun 85.
Jun 85, 233p
Supersedes PB84-868694.

This bibliography contains citations concerning integrated optical circuits. The design and performance of signal processors, waveguides, couplers, and detectors using integrated optics is presented. (This updated bibliography contains 256 citations, 26 of which are new entries to the previous edition.)

20G. Particle Accelerators

536,789
AD-A153 583/0/GAR PC **A05**/MF **A01**
Mission Research Corp., Alexandria, VA.
Further Studies of the NRL Collective Particle Accelerator via Numerical Modeling with the MAGIC Code.
Final rept. 1 Apr-30 Sep 84,
R. J. Barker. Aug 84, 99p Rept no. MRC/WDC-R-066
Contract N00014-84-C-2136

The 2-D. electromagnetic, relativistic simulation code, MAGIC, was used to investigate the detailed physics associated with the operation of the NRL CPA testbed experiment. Code results contradicted the original conclusions drawn from the experimental diagnostics in that the central beam always propagated with a current of 1-2kA in the numerical simulations while the experiemntal probes failed to detect that beam's presence in dual-beam mode of operation. Since 1-2kA was on the sensitivity threshold of their instruments used in the experiment, there is no reason to disbelieve the MAGIC results. This work argues in favor of a renewed CPA effect with improved diagnostics.

536,790
AD-A153 835/4/GAR PC **A04**/MF **A01**
Naval Research Lab., Washington, DC.
Rapid Electron Beam Accelerators (REBATRONS).
Interim rept.,
C. A. Kapetanakos, P. Sprangle, S. J. Marsh, D. Dialetis, and C. Agritellis. 25 Apr 85, 58p Rept no. NRL-MR-5503

We have carried out an extensive numerical and analytical investigation of the beam dynamics in a rebatron accelerator. In this device acceleration occurs by a localized, high gradient electric field and beam confinement is achieved by a strong focusing torsatron magnetic field. In a rebatron, beam acceleration occurs in a few microseconds and limitations imposed by instabilities, field errors and radiation losses can be relaxed. Our studies indicate that both the bandwidth and the maximum electron beam current than can be confined by these devices is remarkably high.

536,791
DE84703299/GAR PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Measurement and Calculation Complex for Experiments at Cyclotron.
A. A. Vinogradov, V. V. Paramonov, V. A. Solov'ev, A. G. Trunov, and A. A. Tsvetkov. 1982, 11p IAE-3640/15
In Russian.
U.S. Sales Only.

Measurement and calculation complex intended for data acquisition, accumulation and processing in real time obtained in experiments in isochronous cyclotron is described. Two EC-1010 computers and the CAMAC equipment make up the basis of the sytem. Specially developed graphic display device is used for representation of one-dimensional and two-dimensional spectra and their marking. Identification of charged particles is realized using digital method by measuring specific energy losses on ionization in a transmission detector and particle energies in a detector of total absorption. Neutrons and gamma quanta are identified by the form of scintillation counter pulses using analog or digital methods. Two-year experience of the complex using in experiments has revealed rather high universality of the developed means, large variety of service capabilities, and high detection efficiency in the whole range of real pulse measuring circuit loadings. (Atomindex citation 15:053789)

536,792
DE84703318/GAR PC **A03**/MF **A01**
Southern Universities Nuclear Inst., Faure (South Africa).
Chairman's Report for Period 1 April 1979 to 31 March 1981 (for the Southern Universities Nuclear Institute, Faure, South Africa).
J. W. R. De Villiers. 1981, 31p SUNI-66, KISU-66
In English, Afrikaans.
U.S. Sales Only.

The report gives an account of the activities of the Southern Universities Nuclear Institute for the period 1979-1981. A short discussion of basic and applied research programmes undertaken during this period is given. Nuclear level parameters using charged particle induced reactions were studied. Mono-energetic neutron sources obtained from the SUNI accelerator were calibrated. Prompt nuclear methods have been extensively studied. The main part of the solid state and materials research programme constituted thin film semiconductor studies with much attention being given to metal silicides. With regard to atomic physics, research on the energy level structure of highly ionized rare gases was continued and the spectrum of krypton analyzed. Projects of biomedical interest were also undertaken, mainly with regard to trace elements. Nuclear techniques were also applied to industrial and environmental problems. (Atomindex citation 15:054074)

536,793
DE85009569/GAR PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Moment Code BEDLAM.
P. J. Channell, L. M. Healy, and W. P. Lysenko. 1985, 3p LA-UR-85-954, CONF-850504-1
Contract W-7405-ENG-36
Particle accelerator conference, Vancouver, Canada, 13 May 1985.

BEDLAM is a fourth-order moment simulation code. The beam at the input to a linear accelerator is specified as a collection of moments of the phase-space distribution. Then the moment equations, which describe the time evolution of the moments, are numerically integrated. No particles are traced in this approach. The accuracy of the computed distribution, the external forces, and the space-charge forces are computed consistently to a given order. Although BEDLAM includes moments to fourth order only, it could be systematically extended to any order. Another feature of this method is that physically interesting and intuitive quantities, such as beam sizes and rms emittances, are computed directly. This paper describes the status of BEDLAM and presents the results of some tests. We simulated a section of radio-frequency quadrupole (RFQ) linac, neglecting space charge, to test the new code. Agreement with a Particle-In-Cell (PIC) simulation was excellent. We also verified that the fourth-order solution is more accurate than the second-order solution, which indicates the convergence of the method. We believe these results justify the continued development of moment simulation codes. (ERA citation 10:023012)

536,794
DE85700448/GAR PC **A07**/MF **A01**
Tsukuba Univ. (Japan). Tandem Accelerator Center.
Annual Report of the Tandem Accelerator Center, University of Tsukuba, April 1, 1982-March 31, 1983.
1983, 129p UTTAC-47
U.S. Sales Only.

The 12 UD Pelletron tandem accelerator has been operated for seven years without serious trouble since the first beam was obtained in February, 1976. In the last year, the tank was opened five times for minor repair, but the operation of 3977 hours has been attained. The construction of a heavy ion post accelerator with interdigital-H type structure has been continued. The research works described in this report were carried out mainly using the beam from a Lamb-shift type polarized ion source or a sputtering ion source. To the Lamb-shift type polarized ion source, a fast spin-reversal system was newly added, and successfully tested. In the sputtering ion source, the beam intensity was increased. A combination of an ionization chamber and a position-sensitive solid state detector was tested to be used for the study on heavy ion nuclear reaction. The characteristics of avalanche along the anode wire in a gas counter were studied. The accelerator and experimental facilities, the development of experimental equipment, and the researches on nuclear physics, atomic and solid state physics, and biological and medical science are reported. (Atomindex citation 16:003627)

536,795
DE85780525/GAR PC **A02**/MF **A01**
British Columbia Univ., Vancouver. TRIUMF Facility.
TRIUMF Low Energy Pion Spectrometer and Channel.
R. J. Sobie, T. E. Drake, B. M. Barnett, K. L. Erdman, and W. Gyles. Aug 83, 9p TRI-PP-83-63
Submitted to Nuclear Instruments and Methods.
U.S. Sales Only.

A low energy pion spectrometer has been developed for use with the TRIUMF M13 pion channel. The combined channel and spectrometer resolution is presently 1.1 MeV at T = 50 MeV. This is limited by the amount of gas and detector material in the spectrome-

ter in addition to the inherent resolution of the channel. Improvements to both the spectrometer and channel are discussed. (Atomindex citation 15:062136)

536,796
PB85-186583/GAR PC **A06**/MF **A01**
General Accounting Office, Washington, DC. Resources Community and Economic Development Div.
DOE's (Department of Energy) Physics Accelerators: Their Costs and Benefits.
1 Apr 85, 102p GAO/RCED-85-96, B-217863

This report provides an inventory of the Department of Energy's existing and planned high-energy physics and nuclear physics accelerator facilities, identifies their associated costs, and presents information on the benefits being derived from their construction and operation. These facilities are the primary tools used by high-energy and nuclear physicists to learn more about what energy and matter consist of and how their component parts or particles are influenced by the most basic natural forces.

20H. Particle Physics

536,797
AD-A153 636/6/GAR PC **A03**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Design Consideration for the X-Ray Cerenkov Experiment.
Master's thesis,
Y. D. Choi. Dec 84, 50p

The feasibility of measuring Cerenkov radiation in the X-ray region was investigated. It is found that the experimental measurement of X-ray Cerenkov radiation is possible for the carbon K (283.84 eV), aluminum L1 (87.01 eV) and L2,3 (72.78 eV) absorption edges. Measurement in the aluminum K (1559.9 eV) absorption edge region was found to be not possible since the real part of the index of refraction did not exceed unity. The relative power from Cerenkov radiation was calculated for the three possible cases and count rate estimates were given. The experimental apparatus for the measurement of X-ray Cerenkov radiation was redesigned to allow measurement of the carbon K edge and aluminum L1 edge. An experiment was attempted, but not completed due to the failure of a necessary preamplifier for a proportional counter. New design considerations were presented and incorporated changes to avoid the experimental shortcomings of previous measurements.

536,798
DE85008171/GAR PC **A05**/MF **A01**
Stanford Linear Accelerator Center, CA.
Weak Interactions of Quarks and Leptons: Experimental Status.
S. Wojcicki. Sep 84, 76p SLAC-PUB-3431, CONF-8407112-3
Contracts AC03-76SF00515, AC03-81ER40050
12. SLAC summer institute on particle physics, Stanford, CA, USA, 23 Jul 1984.
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The present experimental status of weak interactions is discussed with emphasis on the problems and questions and on the possible lines of future investigations. Major topics include; (1) the quark mixing matrix, (2) CP violation, (3) rare decays, (4) the lepton sector, and (5) right handed currents. 118 references. (ERA citation 10:023243)

536,799
DE85008321/GAR PC **A02**/MF **A01**
Stanford Linear Accelerator Center, CA.
Measurements of Heavy Quark and Lepton Lifetimes.
J. A. Jaros. Feb 85, 14p SLAC-PUB-3569, CONF-8407112-5
Contract AC03-76SF00515
12. SLAC summer institute on particle physics, Stanford, CA, USA, 23 Jul 1984.

The PEP/PETRA energy range has proved to be well-suited for the study of the lifetimes of hadrons containing the b and c quarks and the tau lepton for several reasons. First, these states comprise a large fraction of the total interaction rate in e exp + e exp - annihilation and can be cleanly identified. Second, the storage rings have operated at high luminosity and so produced these exotic states copiously. And finally, thanks to the interplay of the Fermi coupling strength, the quark and lepton masses, and the beam energy, the expected decay lengths are in the 1/2 mm range and so are comparatively easy to measure. This pleasant coincidence of cleanly identified and abundant signal with potentially large effects has made possible the first measurements of two fundamental weak couplings, tau implies nu/sub tau/W and b implies cW. These measurements have provided a sharp test of the standard model and allowed, for the first time, the full determination of the magnitudes of the quark mixing matrix. This paper reviews the lifetime studies made at PEP during the past year. It begins with a brief review of the three detectors, DELCO, MAC and MARK II, which have reported lifetime measurements. Next it discusses two new measurements of the tau lifetime, and briefly reviews a measurement of the D exp 0 lifetime. Finally, it turns to measurements of the B lifetime, which are discussed in some detail. 18 references, 14 figures, 1 table. (ERA citation 10:023239)

536,800
DE85009584/GAR PC **A02**/MF **A01**
Rockefeller Univ., New York.
Experiment to Measure the Electron Neutrino Mass Using a Frozen Tritium Source.
O. Fackler, M. Mugge, H. Sticker, R. M. White, and R. Woerner. Mar 85, 9p UCRL-92373, CONF-8410224-4
Contract W-7405-ENG-48
AIP conference on neutrino mass and gauge structure of weak interaction, Cable, WI, USA, 24 Oct 1984.
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We are performing an experiment to determine the electron neutrino mass with the precision of a few eV by measuring the tritium beta decay energy distribution near the endpoint. Key features of the experiment are a 2 eV resolution electrostatic spectrometer and a high-activity frozen tritium source. It is important that the source have electronic wavefunctions which can be accurately calculated. These calculations can be precisely made for tritium and the HeT exp + daughter ion and allow determination of branching fractions to 0.1% and energy of the excited states to 0.1 eV. We discuss the excited final molecular state calculations and describe the experimental apparatus. 2 references, 6 figures. (ERA citation 10:023240)

536,801
DE85009993/GAR PC **A06**/MF **A01**
Department of Energy, Washington, DC. Office of Energy Research.
Annual Report to the Working Group on Technology, Growth, and Employment, April 1985.
Apr 85, 105p DOE/ER-0223
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A meeting of the Working Group on High Energy Physics was convened in Brussels, Belgium, in July 1984, and impaneled new groups of technical experts to report on long-term planning, technical collaborations, and the identification of administrative obstacles experienced within the Summit countries that impede international collaboration. The charges to these three new groups are contained in this report under the section on the Brussels meeting. The reports prepared by the technical experts were then reviewed at the January 1985 meeting at Cadarache, France, and the results are contained in this report under the section on the Cadarache meeting. The Summit Working Group on High Energy Physics believes progress is being made toward cooperation among the Summit countries in the exploration of scientific and technological development upon which the Summit Heads of State and Government declared at Versailles revitalization and growth of the world economy will depend - to a large extent. At Cadarache, the Group found that, since its establishment, international collaboration has increased in the use of present accelerators and in the planning for future accelerators. The Group also found that there are specific areas of technology in which near-term research cooperation is possible. Finally, the Group identified administrative regulations that hamper effective international collaboration in science and technology and that could be revised or eliminated through coordinated, high level Summit action. The major accomplishment of the Working Group thus far has been the creation of a forum for discussions on collaboration in a major field of science by seven industrialized countries. The Group recommends the continuation of its review of long-term plans for major facilities on an intergovernmental basis. (ERA citation 10:023234)

536,802
DE85700210/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Random Model of Two-Level Atoms Interacting with Electromagnetic Field.
A. N. Kireev, A. M. Kurbatov, and A. N. Meleshko. Dec 83, 4p IC-83/234
U.S. Sales Only.

A phase transition has been studied in a random system of two-level atoms interacting with an electromagnetic field. It is shown that superradiation can arise when there is short-range order in a spin-subsystem. The existence of long-range order is irrelevant for this phase transition. (Atomindex citation 15:068667)

536,803
DE85700318/GAR PC **A04**/MF **A01**
National Lab. for High Energy Physics, Oho (Japan).
Spin Analysis of Photoelectrons by Using Synchrotron Radiation.
A. Yagishita. Mar 83, 51p KEK-82-16
In Japanese.
U.S. Sales Only.

This report is the proceedings of a workshop on "Spin analysis of photoelectrons by using synchrotron radiation" held at National Laboratory for High Energy Physics on October 21, 1982. The purpose of this workshop was to examine the feasibility of the experiment on the spin analysis of photoelectrons at the photon factory which has started the operation in 1982. The workshop covered the following subjects on the spin analysis of photoelectrons and on the detectors for spin polarization; the experiment and the theory on the spin analysis of photoelectrons emitted from gas and solid, the detectors for measuring the spin polarization of electron beam, the test experiment on a Mott detector, and further problems. The proceedings contain five papers related to the above subjects. (Atomindex citation 16:000421)

536,804
DE85700460/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Energy Independent Optical Potentials: Construction and Limitations.
M. S. Hussein, and E. J. Moniz. Nov 83, 28p IFUSP-P-439
U.S. Sales Only.

Properties of the energy-independent potential U sup(-) which is wave-function-equivalent to the usual optical potential U(E) are constructed and examined. A simple procedure is presented for constructing U sup(-) in the uniform medium, and physical examples are discussed. The general result for finite systems, a recursive expansion in powers of U(E), is used to investigate the multiple scattering expansion of U sup(-); the energy-independent potential is found to have serious short-comings for direct microscopic construction or phenomenological parametrization. The microscopic theory, as exemplified here by the multiple scattering approach, does not lead to a reliable approximation scheme. Phenomenological approaches to U sup(-) are unattractive because the physics does not guide the parametrization effectively: the structure of the nonlocality is not tied directly to the dynamics; Im U sup(-) changes sign; different elements of the physics, separate in U(E), are completely entangled in U sup -. (Atomindex citation 16:007431)

536,805
DE85700470/GAR PC **A02**/MF **A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Relativistic Strings in a Non-Standard Gauge.
C. A. P. Galvao, and L. J. Negri. 1982, 25p CBPF-NF-025/82
U.S. Sales Only.

Some aspects of the geometric approach to finite open string in a four-dimensional pseudo-Euclidean space-time are analized. The gauge is specified at the end of the process only. (Atomindex citation 16:007509)

536,806
DE85700476/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Non Linear sigma Model, Supergravity and the Spinning String.
E. Abdalla, and R. S. Jasinschi. Jul 82, 33p IFUSP-P-349
U.S. Sales Only.

The locally supersymmetric O(N) non linear sigma model and its connection to the spinning string is discussed. (Atomindex citation 16:007523)

536,807
DE85700492/GAR PC **A03**/MF **A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
M-Subshell Ionization of Au, Pb, Bi and U by Protons.
N. V. de Castro Faria, F. L. Freire Junior, A. G. de Pinho, and E. F. da Silveira. Oct 82, 26p PUC-TN-16/82
U.S. Sales Only.

M-subshell ionization cross section of Au, Pb, Bi and U by protons bombardment were obtained over the projectile range 0.3 - 4.0 MeV. X-ray were detected by Si(Li) spectroscopy. At least one characteristic radiative transition line for each M-subshell was isolated and measured. Radiative and non-radiative branching ratios were taken from theoretical calculations of Bhalla and McGuire. Our total production X-ray cross sections are compared with the measurements of other authors. Comparison of our scaled subshell ionization cross sections with calculations in the plane-wave Born approximation shows, in general, good agreement. Uncertainties in fluorescence yields and in super Coster-Kronig coefficients can introduce great imprecision in some experimentally determined subshell ionizations cross sections. (Atomindex citation 16:007755)

536,808
DE85700502/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Stopping of Silver Ions in Solids.
R. V. Ribas, W. A. Seale, and M. N. Rao. Jun 83, 17p IFUSP-P-409
U.S. Sales Only.

The stopping of Ag ions recoiling through Al, Ti, V, Fe, Ni, Zn, Zr, and Pd was measured at various recoil energies with a method based on the Doppler shift of gamma rays. The dependence of the electronic stopping cross section on the stopper atomic number and on recoil velocity is compared to the semi-empirical predictions of Ziegler et al. (Atomindex citation 16:007881)

536,809
DE85700511/GAR PC **A02**/MF **A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Universal Equation for the Electronic Stopping of Ions in Solids.
E. C. Montenegro, S. A. Cruz, and C. Vargas-Aburto. Sep 82, 23p PUC-TN-14/82
U.S. Sales Only.

An analytical equation for the electronic stopping of ions in solids for non-relativistic velocities, that has no adjustable parameters, is obtained in a semi-phenomenological manner. The very good agreement with experiment gives support to the physical arguments used in its derivation. (Atomindex citation 16:007924)

536,810
DE85700517/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Some New Contributions to Neutrinoless Double beta -Decay in an SU(2) X U(1) Model.
C. O. Escobar, and V. Pleitez. Nov 82, 16p IFUSP-P-371, IFT-P-16/82
U.S. Sales Only.

An SU(2) x U(1) model having both Dirac and Majorana mass terms for the neutrinos, with an extended Higgs sector without natural flavor conservation is considered. Under these conditions, it is shown that for a certain range of the mass parameters of the model, some new contributions become important for the neutrinoless double beta -decay (beta beta)o nu . (Atomindex citation 16:008687)

536,811
DE85700518/GAR PC **A02**/MF **A01**
Vienna Univ. (Austria).
Grand Unified Theories and Proton Decay.
H. W. Rupertsberger. 1984, 6p UWThPh-84-39
U.S. Sales Only.

Proton decay in SU-5 is considered. (Atomindex citation 16:008691)

536,812
DE85700519/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Mechanism for Glueball Production.
C. P. Singh, and S. N. Ram. Aug 84, 9p IC-84/112
U.S. Sales Only.

A production mechanism is suggested to test the production of a glueball resonance in the process pi exp - p implies phiphi n. Our results indicate that gsub(T) resonance in this process corresponds to a quarkonium (ss-bar) state. (Atomindex citation 16:008744)

536,813
DE85700520/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Geometrical Scaling in High Energy Hadron Collisions.
V. Kundrat, and M. V. Lokajicek. Jun 84, 20p IC-84/72
U.S. Sales Only.

The concept of geometrical scaling for high energy elastic hadron scattering is analyzed and its basic equations are solved in a consistent way. It is shown that they are applicable to a rather small interval of momentum transfers, e.g. maximally for Vertical Bart-Vertical Bar <or approx.15 GeV exp 2 for pp scattering at the ISR energies. (Atomindex citation 16:008745)

536,814
DE85700521/GAR PC **A03**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
QCD Determination of the A sub 1 -rho- pi System Through Vertex Light-Cone Sum Rules.
N. S. Craigie, N. Paver, and Jul 84, 27p IC-84/89
U.S. Sales Only.

We analyze the rho-A sub 1 - pi system within the context of vertex light-cone sum rules, which are believed to be rigorously satisfied in QCD. It is pointed out that these sum rules provide very strong constraints on the hadronic spectrum and with additional assumptions lead to new predictions, which go significantly beyond those obtained from current algebra in the past. In particular, we report some new results about the rho-A sub 1 - pi couplings and the various transition form factors in tau-semi-leptonic decays. (Atomindex citation 16:008746)

536,815
DE85700522/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Derivation of a Pion-rho Exchange Three-Body Force and Application to the Trinucleon System.
M. R. Robiliota, and M. P. Isidro Filho. Dec 82, 28p IFUSP-P-380
U.S. Sales Only.

The pion-rho exchange three-body force is derived by means of Lagrangians which are approximately invariant under chiral and gauge transformations. The leading contribution to the potential arises from a seagull diagram, which corresponds to forces that are dominantly repulsive and comparable to those due to the exchange of two pions. The qualitative features of the results are analysed by means of plots of the energy of the trinucleon system. (Atomindex citation 16:008747)

536,816
DE85700523/GAR PC **A02**/MF **A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Dibaryons.
E. M. Ferreira. Oct 82, 15p PUC-TN-15/82
U.S. Sales Only.

The dibaryonic states are an important source of information for the understanding of the strong interactions. The structure of the 6 quark hadrons may reveal properties of these interactions which cannot be investigated in other systems. Our knowledge of the basic nucleon-nucleon interaction and of the nuclear forces in general has changed substantially as a result of the discovery of resonances with baryon number 2. The formation of dibaryons gives important contributions to pion-deuteron processes, and has become an essential ingredient of the description of this three body problem. The same will occur in the study of other systems. The progress of this field, both in experiment and in theory, has been substantial during the last few years. Some aspects of this progress are reviewed here. (Atomindex citation 16:008757)

536,817
DE85700524/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Heavy Baryons as Bound States of Three Quarks.
A. B. D'Oliveira, H. F. de Carvalho, and E. Gerck. 1982, 12p UFRJ-IF-04/82
U.S. Sales Only.

The mass spectrum of heavy baryons as non relativistic bound states of three quarks is calculated, using phenomenological potentials for the quark quark interactions derived from QQ sup(-) effective potentials obtained from fits of the J/psi and UPSILON families. Schroedinger's equation is solved according to Flugge and Zickendraht's prescription, using a method developed specially for confining potentials. Results are compared for several types of confining potentials. (Atomindex citation 16:008758)

536,818
DE85700525/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Decay of Heavy Mesons into Possible Spin 3/2 Leptons.
H. F. de Carvalho, and A. C. B. Antunes. 1982, 13p UFRJ-IF-05/82
U.S. Sales Only.

The recent interest in the study of possible spin 3/2 leptons motivated our calculation of the decay rate of heavy mesons into these leptons. The heavy mesons can be upsilon particles (bb sup(-) systems) or any other system of the qq sup(-) (quark-antiquark) kind with mass larger than those of the upsilon particles, for example, tt sup(-) bound states (not yet detected). The decay rate of these mesons is calculated as a function of the mass of the spin 3/2 leptons. The results obtained are compared with those of the spin 1/2 leptons. (Atomindex citation 16:008759)

536,819
DE85700526/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Bound Systems of Heavy Quarks.
H. F. de Carvalho, and A. B. D'Oliveira. 1982, 22p UFRJ-IF-06/82
In Portuguese.
U.S. Sales Only.

Hadrons are considered as bound states of quarks (mesons = QQ sup(-) and barions = QQQ). An analysis of this model is performed for bound states of heavy quarks, taking into account recent results from perturbative applications of QCD to the bound states of heavy quark - antiquark pairs. (Atomindex citation 16:008760)

536,820
DE85700527/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Hadronic Couplings and Underlying Quark Dynamics.
C. P. Singh, and S. N. Ram. Jul 84, 11p IC-84/102
U.S. Sales Only.

We report certain systematics in the hadronic couplings which we have obtained using S-matrix phenomenology. Their significance regarding the pattern of symmetry breaking in couplings as well as about the underlying quark dynamics is discussed. (Atomindex citation 16:008816)

536,821
DE85700528/GAR PC **A02**/MF **A01**

International Centre for Theoretical Physics, Trieste (Italy).
Neutrino Masses and the Number of Generations.
S. C. Chhajlany, and A. Qadir. Sep 84, 6p IC-84/145
U.S. Sales Only.

Some cosmological considerations which are relevant for the problem of providing bounds on the number of generations in left-right symmetric GUTs are presented. It is pointed out that there is a constraint on the Dirac mass of the neutrinos and the implications of this constraint are discussed. (Atomindex citation 16:008817)

536,822
DE85700529/GAR PC **A04/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Effective Gauge Theories of Composite W, Z and Massless Fermions.
N. S. Craigie, and J. Stern. Apr 84, 68p IC-84/36
U.S. Sales Only.

We have attempted to identify the circumstances under which a weakly coupled massive gauge theory such as the standard Glashow-Salam-Weinberg model, can emerge as a low energy effective Lagrangian of an ASF preon gauge theory. This involves many issues including the interplay between global and local symmetries and sum rules connecting long and short distance physics. The article puts together these issues and demonstrates that ASF preon models can be very tight and predictive frameworks. We make a systematic search of a minimal extension of the standard electro-weak theory, which could emerge as a low energy effective Lagrangian of an ASF preon gauge theory, in which the left-right symmetry is spontaneously broken by vacuum condensation. (Atomindex citation 16:008818)

536,823
DE85700530/GAR PC **A03/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Composite Model of Electroweak Interactions and Its Manifestation at Current Collider Energies.
N. S. Craigie. May 84, 32p IC-84/58
U.S. Sales Only.

We present a preon model based on an ASF confining gauge theory, which has as a low energy effective Lagrangian, an electroweak gauge theory very close to the standard model. However, it is predicted that there are some specific and necessary deviations from the Glashow-Salam-Weinberg model. In this preon model, we assume a spontaneous breakdown (or an induced breakdown) of the left-right symmetry, which prevents spin-one composites made up of right-handed fermions propagating well below the composite scale of order 1 TeV. A consequence of this assumption is shown to be the existence of a pion-like scalar, in addition to the Higgs particle of the standard model. Such a particle - it is further claimed - can give rise to single photon events, through a large branching ratio into the channel pi implies Z gamma or if lighter than the Z through Z implies pi (implies nu nu -bar) + gamma . The model also predicts a signal very similar to the associated gluino production one of supersymmetric grand unified theories. (Atomindex citation 16:008819)

536,824
DE85700531/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
New Selection Rules for the SU(5) Monopole Catalyzed Proton Decay Reactions.
N. S. Craigie, W. Nahm, and K. S. Narain. Aug 84, 13p IC-84/60
U.S. Sales Only.

We show that a complete treatment of all the gauge forces experienced by massless s-wave fermions in the SU(5)-monopole system leads to new selection rules, previously overlooked in the bosonization treatment in which only Abelian gauge fields were considered. The most important consequence of these selection rules is that the catalysis reaction requires an anomaly driven process, the pure boundary condition driven process being highly suppressed. At first sight, this means that one cannot ignore the heavy generations, and consequently the reaction is suppressed. We give arguments why this is in fact not the case. (Atomindex citation 16:008820)

536,825
DE85700532/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Matter-Antimatter Oscillations and Proton Decay in E sub 6.
H. Akcay. Jul 84, 7p IC-84/75
U.S. Sales Only.

We study matter-antimatter oscillations with the hypothesis that the weak isospin conserving mass terms violate C maximally. We find that E sub 6 with the Higgs system 27-bar+351' does not induce hydrogen-antihydrogen oscillations, neutron-antineutron oscillations and proton decay via higher order Feynman diagrams. In the case that we have an additional Higgs multiplet, like 650, these processes are suppressed by a factor M exp -6 where M is a large mass scale. (Atomindex citation 16:008821)

536,826
DE85700533/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Cc-Bar and BB-Bar Spectroscopy in the Two-Step Potential Model.
D. S. Kulshreshtha. Jul 84, 13p IC-84/85
U.S. Sales Only.

We investigate the spectroscopy of the charmonium (cc-bar) and bottonium (bb-bar) bound states in a static flavour independent nonrelativistic quark-antiquark (qq-bar) two-step potential model proposed earlier. Our predictions are in good agreement with experimental data and with other theoretical predictions. (Atomindex citation 16:008822)

536,827
DE85700534/GAR PC **A03/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
X-Versus Y-Scaling in Non-Relativistic Deep Inelastic Scattering.
S. dos Santos Padula, and C. O. Escobar. Feb 83, 28p IFUSP-P-384
U.S. Sales Only.

It is shown in the context of non-relativistic potential scattering, that the appropriate scaling variable for the deep inelastic region is not the usual Bjorken one, x sub(B) sub(j) = Q exp 2 /2M nu but instead, the variable y = 2m nu -q sup(implies) exp 2 . The y-scaling is shown to be obtained in a natural way by using the WKB approximation. Numerical results are presented comparing the approach to scaling in terms of x sub(B) sub(j) and y. (Atomindex citation 16:008823)

536,828
DE85700535/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Correlation Between <P sub(Perpendicular) > and the Central Multiplicity in Hydrodynamical Model.
Y. Hama, and F. S. Navarra. May 83, 14p IFUSP-P-397
U.S. Sales Only.

It is shown that the recently observed growth of <P sub(perpendicular) > when the central multiplicity increases may be interpreted as a natural consequence of hydrodynamical expansion of highly dense hadronic matter formed during multiparticle production processes. (Atomindex citation 16:008824)

536,829
DE85700536/GAR PC **A03/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Is Quark-Antiquark Annihilation Infrared Safe at High Energy.
J. Frenkel, J. G. M. Gatheral, and J. C. Taylor. 1983, 50p IFUSP-P-405
U.S. Sales Only.

In perturbative QCD, the Bloch-Nordsieck cross section for quark-antiquark annihilation is known, to order g exp 4 , to be infrared finite, except for terms which are power suppressed at high energies. A fairly simple explanation of this fact, using analyticity, unitarity and an analysis of mass-singularities in both Feynman and axial gauges, is given. The argument applies fairly easily to order g exp 6 . Assuming a generalized unitarity principle, the argument can be extended to all orders. (Atomindex citation 16:008825)

536,830
DE85700537/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Do Quarks Obey General Statistics.
M. S. D. Cattani, and N. C. Fernandes. Jun 83, 10p IFUSP-P-415
U.S. Sales Only.

Assuming that quarks obey general statistics, a non-relativistic approach is proposed that can describe several properties of hadrons : quark confinemnt, baryonic number conservation and 3-quark saturation in baryons. In this formalism, which is different from parastatistics, the assumption of three triplets of quarks is not necessary. (Atomindex citation 16:008826)

536,831
DE85700538/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Note on a Version of the sigma Non-Linear Model in 3+1 Dimensions.
R. S. Jasinschi. Oct 83, 18p IFUSP-P-434
U.S. Sales Only.

The model proposed by Cremmer and Scherk to represent the Sigma Non-linear Model in 3+1 dimensions is generalized and one can quantize it via functional path integration method. (Atomindex citation 16:008827)

536,832
DE85700539/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Correlation Between Charged-Particle Multiplicities and Pseudo-Rapidity Distributions in Hydrodynamical Cluster Model.
Y. Hama, and F. S. Navarra. Dec 83, 16p IFUSP-P-446
U.S. Sales Only.

It is shown that the correlation between charged-particle multiplicities and pseudo-rapidity distributions, such as the one observed in ISR as well as in recent p sup(-)p collider experiments may well be understood in terms of the previously studied hydrodynamically-expanding large-cluster model. (Atomindex citation 16:008828)

536,833
DE85700540/GAR PC **A02/MF A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Quark Model with One-Gluon Corrections - Ground State.
M. G. do Amaral, and N. Zagury. Feb 82, 12p PUC-TN-01/82
U.S. Sales Only.

Under the assumption that quarks are confined, in a first approximation, by a relativistic potential U(r) = 1/2(1+ beta)V(r), several properties of low-lying baryons have been calculated. Corrections to the mass spectrum have also been calculated, by taking the one gluon exchange into consideration. (Atomindex citation 16:008830)

536,834
DE85700541/GAR PC **A02/MF A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Influence of Light-Quark Masses in Dynamical Scale Breaking.
J. Barcelos Neto, and R. Chanda. 1982, 20p UFRJ-IF-01/82
U.S. Sales Only.

It is demonstrated that light quark masses may significantly contribute to the logarithmic scale breaking in deep inelastic eletromagnetic lepton-nucleon scattering. This is mainly due to the combination of scale variables appearing in structure function equation together with larger 'current' masses for u and d quarks, recently reported in the literature. (Atomindex citation 16:008831)

536,835
DE85700542/GAR PC **A02/MF A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Upper Limits for 'Current Masses' of Light Quarks.
J. Barcelos Neto, and R. Chanda. 1982, 8p UFRJ-IF-03/82
U.S. Sales Only.

A simple way is presented of estimating upper limits of m sub(u) and m sub(d) using positivity properties of the forward eletromagnetic structure function F sub 2 of the nucleon. (Atomindex citation 16:008832)

536,836
DE85700543/GAR PC A02/MF A01
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Lambda sub(C)Sup(+) Baryon Production in Interactions of 40-70 GeV Neutrons with Carbon Nuclei.
A. N. Aleev, V. A. Aref'ev, and V. P. Balandin. 1983, 10p JINR-D-1-83-865
Submitted to the journal Z. Phys., C. Includes original document in Russian.
U.S. Sales Only.

The inclusive production of charmed baryons lambda sub(c)sup(+) by 40-70 GeV neutrons on carbon has been observed. The decays lambda sub(c)sup(+) yields anti K exp 0 p pi exp + pi exp - (130+-18 events) and lambda sub(c)sup(+) yields lambda exp 0 pi exp + pi exp + pi exp - (57+-14 events) have been detected. The mean value of lambda sub(c)sup(+) mass is (2268+-6) MeV/c exp 2 . The product of cross sections of the lambda sub(c)sup(+) inclusive production measured for x > 0.5 and the branching ratios are sigmaxB(anti K exp 0 p pi exp + pi exp -)=(10+-4) mu b per carbon nucleus and sigmaxB(lambda exp 0 pi exp + pi exp + pi exp -)=(2.3+-1.1) mu b per carbon nucleus. The experiment has been performed in the neutron beam of the Serpukhov accelerator using the spectrometer BIS-2. (Atomindex citation 16:008926)

536,837
DE85700548/GAR PC A02/MF A01
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Contribution of Vertical Bargsub(9/2)Sup(-1)Gsub(9/2) > Configuration in the Direct Reaction sup 90 Zr(p,n).
N. N. Titarenko, and E. L. Yadrovskij. 1983, 13p FEI-1425
In Russian.
U.S. Sales Only.

In the framework of the microscopic method of distorted waves (first Born approximation) the contribution of (gsub(9/2)sup(-1)(n)gsub(9/2)(P):Jsup(pi) > states, where Jsup(pi) = 0 exp + / exp + ... 9 exp + , into the neutron rigid group of the integral spectrum of the sup 90 Zr(p, n) sup 90 Nb reaction, where E=22.2 MeV, is estimated. The analysis of the observe differential cross sections of IAS 0 exp + excitation (E=5.15 MeV), 1 exp + (2.126 MeV) and 2 exp + (0.854 MeV) is performed. (Atomindex citation 16:009010)

536,838
DE85780315/GAR PC A06/MF A01
Heidelberg Univ. (Germany, F.R.). Naturwissenschaftliche Gesamtfakultaet.
Development and Construction of Large-Area Ionization Chambers for the Study of Multiparticle Production in Heavy Ion Reactions.
Diss. (Dr.rer.nat.),
J. Betz. 1983, 104p INIS-mf-8769
In German.
U.S. Sales Only.

For the study of nuclear reactions with n particles in the final state three large-area, trapezoidal ionization chambers were constructed by which energy, specific energy loss, time-of-flight, and position coordinates can by measured in a spatial angle of 120 msr. Using two of these detectors the reactions sup 32 S+ sup 28 Si, sup 32 S+ sup 32 S, sup 32 S+ sup 40 Ca, sup 32 S+ sup 58 Ni, and sup 32 S+ sup 74 Ge were studied at an incident energy of 10 MeV/nucleon. (Atomindex citation 15:028761)

536,839
DE85780539/GAR PC A02/MF A01
Johannes Kepler Univ., Linz (Austria).
Progress Report 1983 (for the Johannes Kepler Universitaet Linz, Austria).
H. Paul. 1983, 25p INIS-mf-9097
In German.
U.S. Sales Only.

The main working fields in the institute are 1) inner shell ionization by positive ions 2) surface layer investigations by ion impact 3) precision measurements of stopping power in solids 4) aerosol physics. A publication list is included. (Atomindex citation 15:062362)

536,840
DE85780739/GAR PC A04/MF A01
Goettingen Univ. (Germany, F.R.). Mathematisch-Naturwissenschaftliche Fakultaet.
Experiments on the Elastic Scattering of Photons in the Energy Range Between 20 KeV and 3.5 MeV as Test of Theoretical Predictions of Relativistic Quantum Mechanics and Quantum Electrodynamics.
Diss. (Dr.rer.nat.),
D. Schaupp. 10 Feb 84, 71p INIS-mf-9236
In German.
U.S. Sales Only.

At a photon energy 2.754 MeV differential cross sections for elastic photon scattering were measured at scattering angles between 30 deg and 60 deg for different elements. For the scattering experiments, which were performed in the second part of this thesis with a multiline source at a fixed scattering angle of 7.7 deg, for the applied scatterers lead and tin a good agreement between the measured and the theoretical cross sections could be stated. The contribution of the Delbrueck scattering could be for the first time confirmed experimentally for this small scattering angle. In the framework of the measurement accuracy could be shown that for photon energies <3 MeV and small scattering angles Coulomb corrections can be neglected against the dominating Rayleigh amplitudes. In the third part of the present thesis the Rayleigh scattering on the rare gas xenon was measured in the energy range 28-45 keV at scattering angles of 60 deg, 90 deg, and 120 deg for the first time with polarized synchrotron radiation. (Atomindex citation 16:000294)

536,841
DE85780741/GAR PC A08/MF A01
Hamburg Univ. (Germany, F.R.). Fachbereich Physik.
Bound and Scattering States of Carbon Isotopes.
Diss. (Dr.rer.nat.),
W. M. Wendler. 14 Nov 83, 157p INIS-mf-9232
In German.
U.S. Sales Only.

Starting from the continuum shell model with one particle in the continuum in this thesis nuclei with even mass number were studied. On the example sup 14 C the bound states and their electromagnetic decay properties as well the cross sections for the elastic and inelastic neutron scattering on sup 13 C were calculated. Thereby the author has neither confined himself to the calculation of low lying resonances nor especially the core excitations of sup 12 C were neglected. The calculated results describe well the experimental data. (Atomindex citation 16:001122)

536,842
DE85780742/GAR PC A10/MF A01
Beschleunigerlaboratorium der Univ. und Technischen Univ. Muenchen, Garching (Germany, F.R.).
Acceleration Laboratory of the University and the Technical University of Munich: Annual Report 1983.
1983, 217p INIS-mf-9252
In German.
U.S. Sales Only.

This annual report contains extended abstracts and some extensive descriptions of the work performed at the named institute. The work comprises experimental studies on deep inelastic and transfer reactions, compound-nucleus reactions, p- and alpha -decay, reactions with light and polarized particles, nuclear spectroscopy, atomic collision processes, and accelerator mass spectroscopy, theoretical work on nuclear structure and nuclear reactions, as well as developments on accelerators, targets, detectors, and data processing. A list of publications is included. See hints under the relevant topics. (Atomindex citation 16:001286)

536,843
DE85780743/GAR PC A04/MF A01
Heidelberg Univ. (Germany, F.R.). Naturwissenschaftliche Gesamtfakultaet.
Study of the Continuum of sup 28 Si after Inelastic Excitation with sup 12 C Ions.
Diss. (Dr.rer.nat.),
H. R Schmidt. 19 Oct 83, 70p INIS-mf-9219
In German.
U.S. Sales Only.

For the study of the reaction mechanism of the inelastic scattering of sup 12 C ions at high energy transfer in a particle- gamma coincidence experiment the excitation and the following decay of the nuclear continuum of sup 28 Si was measured by the detection of discrete gamma -transitions in the daughter nuclei. The excitation occurred at 133 and 174 MeV incident energy. The measurement of the energy, multiplicity, and the angular correlation of the coincident gamma radiation from the daughter nuclei allowed conclusions on the mechanism of the particle decay of the inelastic continuum. The interpretation of the continuum cross section resulted on the one hand in the framework of Hauser-Feshbach evaporation calculations, which describe statistical emission of particles from an equilibrated, highly excited sup 28 Si nucleus, and on the other hand under the assumption of a direct population of 3-body final states by proton, neutron, or alpha pickup with following decay of the ejectile back to the inelastic excited channel (pickup/breakup processes). At 174 MeV the inelastic nuclear continuum for energy losses larger than 30 MeV results mainly from pickup/breakup reactions. However at 133 MeV incident energy beside the direct population of 3-body final states additionally statistical emission of particles from the equilibrated sup 28 Si nucleus after inelastic excitation of continuum states plays a comparable role. From this it is evident that the dissipative contributions of the inelastic excitation at 133 MeV are distinctly stronger than at the higher incident energy. (Atomindex citation 16:001343)

536,844
DE85780744/GAR PC A06/MF A01
Frankfurt Univ. (Germany, F.R.). Fachbereich Physik.
Study of the Nuclear Reactions sup 208 Pb + sup 58 Ni and sup 208 Pb + sup 64 Ni with a Focusing Time-of-Flight Spectrometer.
Diss. (Dr.rer.nat.),
K. Sapotta. 12 Jul 83, 122p INIS-mf-9234
In German.
U.S. Sales Only.

In the first part of this thesis the construction of a time-of-flight spectrometer for heavy ions with magnetic focusing is described. Then ion trajectories are calculated, and the effective spatial angle and the angular resolution are determined. In the second part the study of quasielastic transfer and deep inelastic reactions of sup 58 Ni and sup 64 Ni with sup 208 Pb at E=265 MeV respectively 260 MeV by means of this spectrometer is described. (Atomindex citation 16:001417)

536,845
DE85780760/GAR PC A11/MF A01
Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.).
Description of Relativistic Nucleus-Nucleus Collisions in a Field Theoretical Model.
Diss,
J. Theis. Aug 84, 232p GSI-84-9
In German.
U.S. Sales Only.

For the purpose of studying high energy heavy-ion collisions a self-consistent theory of relativistic nuclear fluid-dynamics coupled to classical meson fields is developed. The essential difference to the conventional fluid dynamic description arises from the coupling of meson fields to the nuclear fluid and from the nonlinear relation for the effective baryon mass leading to a relativistic self-consistent description for the nuclear equation of state. The effects of different equations of state resulting from linear and nonlinear mean field approaches are studied in the event-by-event kinetic flow analysis of heavy ion collisions. The predictions for the symmetrical system Nb(Esub(Lab)=400 MeV/N)Nb are in good agreement with the experimental 4 pi - data. Investigating the phase structure in the linear mean field approach a phase transition occuring at Tapprox.=200 MeV for chemical potential mu =0 was found in this model. This transition is similar to recent QCD predictions. The model indicates a further phase transition at Tapprox.=20 MeV (baryon fluid to gas). There is, however, no correct description of the compressibility of nuclear matter in the linear mean field model. The extension to nonlinear scalar meson interaction allows for a correct description of the bulk properties of nuclear matter. It was found though that the phase transition is always present for reasonable values of the coupling constants. (ERA citation 10:019490)

536,846
PB85-185478/GAR PC E04/MF E04
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.

Neutron Tests on Samarium Polarising Filters,
J. Mayers, R. Cywinski, T. J. L. Jones, and W. G. Williams. c1984, 39p RAL-84-118

Results are given of tests on resonance absorption neutron polarising filters containing (149)Sm. The temperature dependence of the transmittance was measured as a function of neutron energy using the time of flight method on a pulsed source. These measurements allowed the polarizing efficiencies of a SmCo5 filter to be determined at temperatures between 0.012K and 0.045K. Preliminary data was also obtained for a filter consisting of a 1% solution of samarium in palladium and gave encouraging results. The authors describe some of the practical problems encountered during the measurements and discuss implications for future operations on the RAL Spallation Neutron Source.

536,847
PB85-186088/GAR PC **E03**/MF **E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Observations of a Very Long-Lived (D bar, sup 0) Decay to Kappa(+) pi(+) pi(-) pi(-) with a Proper Flight Time of 55 x 10 to the -13 power Seconds,
K. Abe, R. Armenteros, T. C. Bacon, J. Ballam, and H. H. Bingham. c1984, 16p RAL-84-110
Contract DE-AC03-76SF00515
Also pub. as Stanford Linear Accelerator Center, CA. rept. no. SLAC-PUB-3493. Sponsored by National Science Foundation, Washington, DC.

The characteristics of a very interesting event recently found in an exposure of the SLAC Hybrid Facility to 20 GeV photons are discussed. This event contains two decays and is consistent with the production and decay of two charmed particles. The longer decay, of length 9mm, fits the hypothesis (D bar, sup 0) yields Kappa(+) pi(+) pi(-) pi(-) and has a proper flight time of 55 x 10 to the -13th power. Possible background sources for this event are investigated and found to be extremely small. (Copyright (c) Science and Engineering Research Council 1984.)

536,848
PB85-186476/GAR PC **E03**/MF **E03**
Oxford Univ. (England). Nuclear Physics Lab.
Unavoidable Errors in the Determination of the Kinematic Variables x,Q(2sup2) for Charged Current Events at HERA,
M. G. Bowler, and S. L. Lloyd. 1983, 14p REF-16/85

It is shown that the kinematic variables x,(Q sup 2), calculated from current jet momentum and energy, depart from the true values by an amount which depends on the mass of the target (spectator) jet. Essential information is therefore lost down the beam pipe, resulting in an unavoidable loss of resolution at HERA. The kinematic regions seriously affected are identified.

536,849
PB85-186484/GAR PC **E03**/MF **E03**
Oxford Univ. (England). Nuclear Physics Lab.
Angular Correlations in Heavy Ion Reactions,
S. Marsh, and W. D. M. Rae. 1984, 15p REF-4/85

In this letter, we examine the properties of the in-plane correlation between the initial scattering angle and the angle at which subsequent particle decay occurs, following a forward angle heavy-ion reaction. The results are obtained in the Strong Absorption limit. In particular, we explain the recent experimental observation that there is a systematic dependence of the correlation distributions on the initial scattering angle of the excited nucleus. We generalize this result to the case of nuclei with non-zero spins in the decay channel, and we also obtain closed form expressions for the correlation function under general matching conditions.

536,850
PB85-187078/GAR PC **E13**/MF **E13**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Particle Physics Experiments 1984.
1984, 318p RL-85-001
See also DE85-700134. Errata sheet inserted.

This report describes work carried out in 1984 on experiments approved by the Particle Physics Experiments Selection Panel. The contents consist of unedited contributions from each experiment.

536,851
PB85-189751/GAR PC **E04**/MF **E04**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Compilation of Structure Functions of Deep Inelastic Scattering,
R. G. Roberts, and M. R. Whalley. c1984, 39p RAL-84-125
Prepared in cooperation with Durham Univ. (England).

This is a review of data on the structure functions 2x(F sub 1), (F sub 2), x(F sub 3), (F sub L) or R = (sigma sub L)/(sigma sub T) from nu, nu bar, e(-), mu(+) scattering off protons and nuclei. The relevant experiments at CERN, Fermilab and SLAC up to Jan. 1st 1985 are covered. All the data in this review can be found and retrieved in the Durham-RAL HEP database, together with a wide range of other reaction data. Users throughout Europe can interactively access the database through CMS on the RAL central computer. (Copyright (c) Science and Engineering Research Council 1984.)

536,852
PB85-189769/GAR PC **E03**/MF **E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Quarks in Nuclei,
R. G. Roberts. c1984, 11p RAL-84-117

Topics discussed include the following: Confinement size changes and dynamical rescaling; A dependence; Low-x region - excess pi's (question); Gluons - change of confinement size too (question); Why do nucleons get bigger in a nucleus (question).

536,853
PB85-190635/GAR PC **E03**/MF **E03**
Oxford Univ. (England). Dept. of Theoretical Physics.
Corrections to the Adiabatic Limit in the Flux Tube Model,
J. Merlin, and J. Paton. 1984, 23p REF-89/84

Corrections to the adiabatic potential picture of q (q bar) systems are estimated using a flux tube model recently described. Mixing of the lowest adiabatic surfaces is small for heavy quark systems. For light quark systems, the authors suggest a way of redefining the adiabatic surfaces so that in this case also mixing effects are small. Mixing effects are included in estimates of the lowest hybrid masses.

536,854
PB85-190809/GAR PC **E03**/MF **E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Supersymmetric Models without R Parity,
G. G. Ross, and J. W. F. Valle. c1984, 12p RAL-84-102

It is shown that many supersymmetric models may spontaneously break R parity through scalar neutrinos acquiring a vacuum expectation value (vev). These models allow supersymmetric particles to be produced singly and to decay to nonsupersymmetric states. This leads to a new pattern of supersymmetric phenomenology. The lepton number violation to be expected in this class of models is discussed.

536,855
PB85-190932/GAR PC **E03**/MF **E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
F-Sum Rule for Magnetic Neutron-Electron Scattering,
S. W. Lovesey, and K. N. Trohidou. c1984, 23p RAL-84-126

It is shown that measurements of the first frequency moment of the response function observed in magnetic neutron scattering from electrons will feature details of the electron correlations. The first frequency moment, or f-sum rule as it is often called, for magnetic scattering is therefore distinctly different from the corresponding sum rule for particle density interactions. The behaviour of the magnetic f-sum rule as a function of wave vector is illustrated, together with the mean-square energy transfer, in an approximate calculation for an electron plasma.

536,856
PB85-193928/GAR PC **E04**/MF **E01**
Israel Atomic Energy Commission, Yavne. Soreq Nuclear Research Center.
Plutonium-242 Nuclear Data Evaluation,
M. Caner, and S. Yiftah. Feb 84, 58p IA-1400
Portions of this document are not fully legible.

An evaluation of (242)Pu neutron data was performed. All significant cross sections in the neutron energy range 0.001 to 15,000,000 eV were considered. The experimental data were complemented by spherical optical model and statistical theory calculations. The evaluated data were compared with those in the ENDF/B-V file.

20I. Plasma Physics

536,857
AD-A153 441/1 Not available NTIS
New York Univ., NY. Courant Inst. of Mathematical Sciences.
Essential Spectrum of Ideal Magnetohydrodynamics,
E. Hameiri. 1985, 24p
Availability: Pub. in Communications and Applied Mathematics, v38 p43-66, 1985 (No copies furnished by DTIC/NTIS).

The essential spectrum of magnetohydrodynamics is shown to arise from waves propagating one-dimensionally along magnetic field lines. Different polarizations of these waves give rise to the 'Alfven' and 'ballooning' spectra. The essential spectrum of an axisymmetric equilibrium when a single azimuthal mode number is considered consists of the Alfven spectrum only, while the ballooning modes appear as intervals of accumulation of discrete eigenvalues with different mode numbers. We derive some necessary and one sufficient conditions for stability and show some examples where the criteria coincide to yield a simple condition for stability.

536,858
AD-A153 608/5/GAR PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Projections of Plasma Cloud Structures and their Spectra.
Memorandum rept. Oct 83-Oct 84,
N. J. Zabusky, E. Hyman, and M. Mulbrandon. 22 Apr 85, 30p Rept no. NRL-MR-5561

We have established a relationship between the asymptotic spectral index of idealized piecewise-constant optically-thin radiating sources and their scans. For piecewise-constant clouds, where the one-dimensional asymptotic spectrum of the power is proportional to 1/k squared, we have shown that the asymptotic spectrum of the scan depends upon the character of the contour. We also apply the results to the interpretation of optical scans from two PLACES events. These are insufficiently resolved and their estimated spectral index of 2.5 is associated with a composite of effects and not the nonlinear dynamics of striation evolution.

536,859
AD-A153 833/9/GAR PC **A02**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Two-Dimensional One-Component Plasma in an Inhomogeneous Background: Exact Results,
A. Alastuey, and J. L. Lebowitz. Dec 84, 18p
AFOSR-TR-85-0362
Grant AFOSR-82-0016
Pub. in Jnl. of Physique, v45 p1859-1874 Dec 84.

We study the general inhomogeneous two-dimensional jellium where the background density varies in one space direction only. At P = 2, explicit functional representations of the one- and two-body densities of the particles are derived in terms of the electrostatic potential created by the background. The present model can be used for describing a large variety of charged interfaces.

536,860
AD-A153 837/0/GAR PC **A02**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Exact Results for the Two-Dimensional One-Component Plasma,
D. Nicolaides. 9 Jul 84, 3p AFOSR-TR-85-0352
Grant AFOSR-82-0016
Pub. in Jnl. of Physics Letters, v103A n5 p277-278, 9 Jul 84.

We show that the free energy and correlation functions of the two dimensional one-component plasma at the special temperature can be explicitly computed by solving a free-field Dirac equation.

536,861
AD-A153 888/3/GAR PC **A02/MF A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
New Systematic Expansion of the Electric Field Distribution in Plasmas.
A. Alastuey, C. A. Iglesias, J. L. Lebowitz, and D. Levesque. Nov 84, 13p AFOSR-TR-85-0361
Grant AFOSR-82-0016
Pub. in Physical Review A, v30 n5 p2537-2547 Nov 84.

We derive a new systematic expansion of the electric field distribution at a test charge immersed in an infinite two- or three-dimensional one-component plasma. The lowest-order truncation of this expansion leads to a mean-field theory very similar to the adjustable-parameter exponential approximation (APEX). The next-order corrections to this mean-field theory are explicitly computed in terms of the distribution functions of the plasma particles. All the approximations are compared to the Monte Carlo results for a two-dimensional system at P=2 and various test charges. The systematic approximations appear to be useful. Even the zeroth-order approximation is quite accurate for large test charges or strongly coupled systems and the next order improves on it. Still, APEX is found to be most reliable (as it is also in three dimensions) and remains accurate in the practical interesting limit where the test charge vanishes, i.e., at a neutral atom.

536,862
AD-A153 933/7/GAR PC **A02/MF A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
Electric Microfield Distributions in Multicomponent Plasmas,
C. A. Iglesias, J. L. Lebowitz, and L. Livermore. Oct 84, 6p AFOSR-TR-85-0359
Contract W-7405-eng-48, Grant AFOSR-82-0016
Pub. in Physical Review A, v30 n4 p2001-2004 Oct 84.

We evaluate the electric microfield distribution in a multicomponent plasma (MCP). The method employed is an adaption of the very simple adjustable-parameter exponential approxiamtion previously developed for one-component plasmas (OCP). We also discuss a still simpler approximation in which the MCP is replaced by an effective OCP. The results are generally close to each other and the former is in very good agreement with computer simulations.

536,863
AD-A153 980/8/GAR PC **A07/MF A01**
Polytechnic Inst. of New York, Farmingdale. Dept. of Electrical Engineering.
Millimeter Wave Generation by Relativistic Electron Beams.
Annual rept. 1 Oct 83-30 Sep 84,
S. P. Kuo, and B. R. Cheo. 1 Dec 84, 131p POLY-84-007, AFOSR-TR-85-0342
Grant AFOSR-83-0001

We are studying various wave-plasma interaction processes towards the understanding of the collective physics of plasmas. The processes include the mechanisms leading to the generation of millimeter waves by relativistic electron beams (electron cyclotron maser instability) and the mechanisms providing channels for anomalous absorption of electromagnetic waves (electron cyclotron resonance heating and parametric instabilities). A single nonlinear equation which describes the temporal evolution of the field amplitude of the electron cyclotron maser instability has been derived self-consistently. Three adiabatic invariants of the electron motion under the electon cyclotron resonance heating by three differently polarized heater: (1) ordinary mode; (2) extraordinary mode; and (3) electrostatic mode are derived. Wave plasma interaction leading to various parametric instabilities in the ionosphere has also been studied.

536,864
DE85007853/GAR PC **A04/MF A01**
Oak Ridge National Lab., TN.
Theory of the Magnetic Field and Plasma Rotation in a Stellarator.
M. Coronado-Gallardo. 1984, 57p ORNL-tr-5197
Contract AC05-84OR21400
Translation source information not available .Thesis. Portions of this document are illegible in microfiche products.

The following topics are discussed: (1) the continuity equation, (2) impulse balance equation, (3) plasma velocity, (4) diffusion fluxes, (5) viscosity and impact term, (6) determination of parallel velocity, (7) the ambipolar electric field, (8) calculation of diffusion fluxes and currents, and (9) application to stellarator Wendelstein VII-A. (ERA citation 10:023324)

536,865
DE85010085/GAR PC **A03/MF A01**
Texas Univ. at Austin. Inst. for Fusion Studies.
Covariant Poisson Brackets for Classical Fields.
J. E. Marsden, R. Montgomery, P. J. Morrison, and W. B. Thompson. Jan 85, 26p DOE/ET/53088-168, IFSR-168
Contract FG05-80ET53088

Poisson brackets that are covariant under spacetime coordinate changes are presented for relativistic field theories. The formalism described here is an alternative to the symplectic formulation of field theories and has several advantages. It applies to relativistic fluids and plasmas written in Eulerian variables, while the symplectic formulation does not. It is expected to simplify and clarify the transition to the dynamical (or 3+1) Hamiltonian formalism as well. (ERA citation 10:023300)

536,866
DE85010155/GAR PC **A02/MF A01**
Argonne National Lab., IL.
Low Plasma Edge Temperatures for the Self-Pumped Limiter.
W. K. Terry, and J. N. Brooks. Mar 85, 23p ANL/FPP/TM-201
Contract W-31-109-ENG-38

Transport code calculations have been performed to study the operation of an INTOR-like tokamak plasma from which helium is removed by a self-pumped limiter, which traps helium, but not hydrogen, in its surface layers. To prevent saturation by helium, the surface is renewed by continuous injection of the surface material (vanadium in this study) into the scrape-off layer. The presence of the injected vanadium leads to plasma temperatures well below 50 eV in the scrape-off layer, with supplementary rf heating. Operation in this edge temperature regime is essential for the use of medium- and high-Z limiter coatings. (ERA citation 10:023296)

536,867
DE85700306/GAR PC **A07/MF A01**
Risoe National Lab., Roskilde (Denmark).
Nonlinear Transient Wave Propagation in Homgeneous Plasmas.
K. Thomsen. Jan 83, 131p RISO-M-2370
In Danish.
U.S. Sales Only.

The transient phenomena associated with the propagation of nonlinear high frequency waves in homogeneous and isotropic or anisotropic plasma are considered. The basic equation for the different wave types included in this analysis are derived by using a two-fluid description of the plasma. Before discussing the importance of different nonlinearities the main results from a linear treatment are given. Generation of harmonic and local changes in the plasma frequency caused by ponderomotive forces are the nonlinear phenomena which are included in the nonlinear treatment. Generation of harmonics is only important for extraordinary waves and this case is discussed in detail. The density perturbations are described either as forced non-dispersive or as forced dispersive low frequency electrostatic waves. The differences between these two descriptions are first considered analytically then by a numerical analysis of the problem with the influence of the density variations on the propagation of the high frequency wave included. A one-dimensional description is used in all cases. (Atomindex citation 15:071050)

536,868
DE85700320/GAR PC **A04/MF A01**
International Atomic Energy Agency, Vienna (Austria).
Application of Active Neutral Li Beam for Impurity Transport Studies in Magnetically Confined Plasmas and Related Cross-Section Measurements. Coordinated Programme on Atomic Collision Data for Diagnostics of Magnetic Fusion Plasmas. Final Report for the Period 1 December 1979-30 September 1984.
H. Winter. Jun 84, 70p IAEA-R-2497-F
U.S. Sales Only.

In the frame of a research contract of the Technische Universitaet Wien with the IAEA, x-sections of excitation and capture in collisions of Li with H exp + , He exp 2+ , Csup(3-6) exp + and Osup(4-7) exp + were measured by Prof. H. Winter group in Vienna in collaboration with Prof. F.J. de Heer group (University of Groningen). Data obtained include excitation x-sections in charge exchange (Li(2s)+H exp + implies Li exp + +H(3l)) and excitation (Li(2s)+H exp + implies Li(2p)+H exp +), total electron capture x-sections (Li(2s)+H exp + implies Li exp + + sigma sub(n,1) H(n,l)), state selective x-sections for C exp 4+ +Li collisions and emission x-sections for Csup(3-6) exp + and Osup(4-7) exp + colliding with Li deg. in the near uv and visible region. The obtained data will be used in a Li-injector to be connected to the TEXTOR Tokamak experiment in Juelich in view of plasma impurity diagnostics by means of active Li deg. beams. (Atomindex citation 16:000514)

536,869
DE85700321/GAR PC **A02/MF A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Multimode Description of the Nonlinear Evolution of Modulational Instabilities in Plasmas.
R. Bingham, and C. N. Lashmore-Davies. Aug 84, 18p RAL-84-072
U.S. Sales Only.

A general discussion of modulational instabilities in plasmas is given. The basic mechanism is a four wave interaction and examples include the langmuir modulational instability, the oscillating two-stream instability and the filamentation of laser light in plasmas. General equations for the modulation of finite amplitude, high frequency waves in unmagnetised plasmas are given. The stability properties of the linearised equations are briefly discussed and the conservation relations of the fully nonlinear equations are obtained. The filamentation of an electromagnetic wave in a plasma is discussed in more detail. Exact analytic solutions of the fully nonlinear equations are obtained, and the resulting filamentation length compared with experiment. (Atomindex citation 16:000566)

536,870
DE85750300/GAR PC **A05/MF A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Neutronenphysik und Reaktortechnik.
Influence of Gradual Density Transition and Nonlinear Saturation on Rayleigh-Taylor Instability Growth.
H. Jacobs. Aug 84, 80p KFK-3756
U.S. Sales Only.

Linear theory of Rayleigh-Taylor instability growth at a density profile which varies exponentially between regions of constant density is discussed in detail. The exact theory provides an approximate but conservative simple formula for the growth constant and it shows that a hitherto widely used theory erroneously underestimates the growth constant. A simple but effective "synthetical model" of nonlinear bubble growth is obtained from a synthesis of linear theory and constant terminal bubble speed. It is applied to pusher shell break-up in an inertial confinement fusion pellet to determine the maximum allowable initial perturbations and the most dangerous wavelength. In a situation typical of heavy ion drivers it is found that the allowable initial perturbations are increased by a few orders of magnitude by the gradual density transition and another order of magnitude by nonlinear saturation of the bubble speed. The gradual density transition also shifts the most dangerous wavelength from about once to about four times the minimum pusher shell thickness. The following topics are treated briefly: Reasons conflicting with use of the synthetical model to decide whether the pusher shell in a certain simulation will be broken up; other nonlinear theories available in the literature; further realistic effects that might aggravate instability growth. (ERA citation 10:011934)

536,871
DE85750303/GAR PC **A02/MF A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Analysis of Local Transport in Neutral-Beam-Heated L and H Plasmas of ASDEX.
G. Becker, K. Bernhardi, A. Eberhagen, G. Fussmann, and O. Gehre. Jun 84, 20p IPP-III-98
U.S. Sales Only.

A well-diagnosed series of high-confinement (H) discharges in ASDEX is studied in detail by transport modelling. Computed temperature and density profiles in the Ohmic and H phases are compared with measurements. Profiles for the electron heat diffusivity chisub(e), diffusion coefficient D and inward drift velocity vsub(in) are determined for the whole plasma including the scrape-off zone. Empirical scaling relations of these quantities in the L and H regimes are presented. The development of density and temperature profiles after transition to the H phase is investigated. The inward drift with neutral injection is studied. (ERA citation 10:011933)

536,872
PB85-185924/GAR PC **E03/MF E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Particle Acceleration in Space and Laboratory Plasmas.
R. Bingham, D. A. Bryant, and D. S. Hall. c1985, 21p RAL-84-057
Presented at the Canadian Association of Physicists Annual Meeting Held at Sherbrook, Quebec, on June 18, 1984.

The general principle of charged particle acceleration in space and laboratory plasmas is illustrated by a discussion of particular types of acceleration mechanisms which can be classified as either deterministic processes or stochastic processes. Acceleration by parallel electric fields, produced in double layers is an example of a deterministic process. Fermi acceleration and acceleration by turbulent wave fields are examples of stochastic processes. The physical acceleration mechanism involved in each type of process is discussed, and examples are given for space and laboratory plasmas. (Copyright (c) Science and Engineering Research Council 1985.)

536,873
PB85-190924/GAR PC **E03/MF E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Saturation of Plasma Beat Waves.
R. Bingham, R. A. Cairns, and R. G. Evans. c1984, 17p RAL-84-122

The authors analyze the saturation mechanism for the electrostatic plasma wave excited by two electromagnetic waves, and show that the level is determined not only by the relativistic frequency shift but also by the frequency shift produced by second harmonics of the electrostatic plasma wave. The frequency shift due to the higher harmonics dominates, with the frequency increasing rather than decreasing with amplitude. The positive frequency shift makes the wave stable to the development of strong turbulence. The analytical results are directly checked by numerical simulations carried out using a 1-D particle in cell code showing excellent agreement between the two approaches.

20J. Quantum Theory

536,874
DE85700206/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
New Exact Path Integral Treatment of the Hydrogen Atom.
N. K. Pak, and I. Sokmen. Aug 83, 7p IC-83/148
U.S. Sales Only.

Using a recently developed general new-time transformation method, free of operator ordering ambiguities by construction we reconsider the hydrogen atom problem. We solve the problem direcly without any dimension raising trick. (Atomindex citation 15:068663)

536,875
DE85700245/GAR PC **A02/MF A01**
International Centre for Theoretical Physics, Trieste (Italy).
Renormalization-Group Decimation Technique for Spectra, Wave-Functions and Density of States.
C. Wiecko, and E. Roman. Sep 83, 15p IC-83/162
U.S. Sales Only.

The Renormalization Group decimation technique is very useful for problems described by 1-d nearest neighbour tight-binding model with or without translational invariance. We show how spectra, wave-functions, and density of states can be calculated with little numerical work from the renormalized coefficients upon iteration. The results of this new procedure are verified using the model of Soukoulis and Economou. (Atomindex citation 15:069174)

536,876
DE85700449/GAR PC **A05/MF A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Topics of Differential Geometry in Hamiltonian and Lagrangian Mechanics and Relativity.
P. R. Rodrigues. 1982, 85p CBPF-MO-001/82
In Portuguese.
U.S. Sales Only.

An introduction to the tensor and exterior algebra as to the differential geometry is made. Such a geometry is used in order to study the Hamiltonian and Lagrangian mechanics stressing their geometrical aspects. Some applications are done in relativity theory. (Atomindex citation 16:007417)

536,877
DE85700450/GAR PC **A03/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Generalized Langevin Equation for the Extended Charge in Stochastic Electrodynamics.
H. de Menezes Franca, and G. C. Santos. Aug 82, 37p IFUSP-P-357
U.S. Sales Only.

A covariant equation for the motion of the extended charge is derived and it is shown how a consistent description is achieved for nonrelativistic velocities. If the external force is generated by the classical stochastic zero-point electromagnetic field the equation of motion has the form a Langevin equation with memory. The memory function is due to radiation reaction and is related to the charge density which it is assumed to be spherically symmetric and rigid in the nonrelativistic limit. Some deviations from similar attempts are obtained. The extention of the results to finite temperatures is discussed. (Atomindex citation 16:007421)

536,878
DE85700452/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
K-Harmonics Methods and the Bound-State Spectrum of One-Dimensional Three-Body System.
C. P. Malta, and F. A. B. Coutinho. Mar 83, 23p IFUSP-P-391
U.S. Sales Only.

The symmetry properties of one-dimensional hyperspherical harmonics components have been investigated. For a system of three identical particles moving in one-dimension it is shown how to construct solutions of definite parity and definite transformation properties under permutation of any particle pair. General qualitative features of the spectrum of the one-dimensional system are deduced for particles satisfying Bose-Einstein, Fermi-Dirac and Boltzmann statistics. (Atomindex citation 16:007423)

536,879
DE85700453/GAR PC **A03/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
General Statistics and Second Quantization.
M. S. D. Cattani, and N. C. Fernandes. Apr 83, 33p IFUSP-P-395
U.S. Sales Only.

In order to obtain commutation relations for the creation and annihilation operators for the para-particles in Quantum Mechanics, a somewhat new second quantization method is proposed. Its shown that for bosons and fermions the usual bi-linear commutation relations are valid and that for the para-particles the commutation relations have a multilinear matricial form. It is also shown that from a symmetric group point of view, it is hard to accept the paraboson and parafermion concepts in Quantum Mechanics. (Atomindex citation 16:007424)

536,880
DE85700454/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Existence of Bound States of N-Particle Systems in One- and Two-Dimensions.
F. A. B. Coutinho, C. P. Malta, and J. F. Perez. May 83, 10p IFUSP-P-399
U.S. Sales Only.

Sufficient conditions are given for the existence, in one- and two-dimensions, of bound states of a system of N-particles interacting via two-body potentials. (Atomindex citation 16:007425)

536,881
DE85700455/GAR PC **A03/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
General Statistics, Second Quantization and Quarks.
M. S. D. Cattani, and N. C. Fernandes. Aug 83, 37p IFUSP-P-421
U.S. Sales Only.

A somewhat new second quatization method is proposed in order to obtain commutation relations for intermediate states in quantum mechanics. These commutation rules are found to have a multilinear matricial form, whereas for bosons and fermions the usual bilinear relations are reobtained. It is shown that from a symmetric group point of view, it would be hard to accept the paraboson and parafermion concepts in quantum mechanics. Assuming that quarks can be represented by intermediate states, several properties of hadrons, such as quark confinement, baryonic number conservation, and 3-quarks saturation in baryons, seem to have a natural explanation. (Atomindex citation 16:007426)

536,882
DE85700456/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Action-Angle Variables for the Harmonic Oscillator : Ambiguity Spin X Duplication Spin.
C. R. de Oliveira, and C. P. Malta. Aug 83, 23p IFUSP-P-424
U.S. Sales Only.

The difficulties of obtaining a well defined unitary transformation to action-angle variables for the harmonic oscillator were overcome by M. Moshinsky and T.H. Seligman through the introduction of a spinlike variable (ambiguity spin) from a classical point of view. The difficulty of defining a unitary phase operator for the harmonic oscillator was overcome by Roger G. Newton also through the introduction of a spinlike variable (named duplication spin by us) but within a quantum framework. The relation between the ambiguity spin and the duplication spin by introducing these two types of spins in the canonical transformation to action-angle variables is investigated. Doing this it is possible to obtain both well defined unitary transformation and phase operator. (Atomindex citation 16:007427)

536,883
DE85700458/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Some General Properties of the Point Spectrum of Three Particles Moving in One-Dimension.
J. F. Perez, C. P. Malta, and F. A. B. Coutinho. Sep 83, 14p IFUSP-P-431
U.S. Sales Only.

The eigenstates of three-particles moving in one-dimension are classified according to the S sub 1 plus parity group. The ordering of the ground state S sub 3 band is given for a fairly general class of potentials. Sufficient conditions are given both for existence and non-existence of bound states of a given symmetry. (Atomindex citation 16:007429)

536,884
DE85700459/GAR PC **A02/MF A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Sufficient Conditions for the Existence of a Bound State in the N-Body Problem.
J. F. Perez, C. P. Malta, and F. A. B. Coutinho. Sep 83, 14p IFUSP-P-432
U.S. Sales Only.

Simple sufficient conditions for the existence of a bound state in the system of N particles interacting via a purely attractive two-body potential are provided.

This method is based on a variational approach. (Atomindex citation 16:007430)

536,885

DE85700461/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Lower Bound for the Energy of the Ground State of Bosons Moving in One Dimension.
C. P. Malta, J. F. Perez, and F. A. B. Coutinho. Dec 83, 8p IFUSP-P-445
U.S. Sales Only.

It is shown that the ground state energy of N bosons of mass m moving in one dimension is greater than E = - m/16h/2 pi exp 2 N exp 2 (N-1)) integral sup(+ infinite) sub(- infinite) V(x)dx) where V(x) is the two-body potential. It is conjectured that E = - m/24h/2 pi exp 2 N(N exp 2 -1)) integral sup(+ infinite) sup(infinite) V(x)dx) exp 2 provides a lower bound. (Atomindex citation 16:007432)

536,886

DE85700462/GAR PC **A03**/MF **A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Homogeneity of Riemannian Space-Times of Goedel Type.
M. J. Rebouças, and J. Tiomno. 1982, 42p CBPF-NF-048/82
U.S. Sales Only.

The conditions for space-time homogeneity of a Riemannian manifold with a Godel-type metric are examined. The Raychaudhuri-Thakurta necessary conditions are shown to be also sufficient and to lead to five linearly independent Killing vectors. These vector fields are exhibited for the most general case and their algebra are examined. The irreducible set of isometrically independent ST-homogeneous Godel-type metrics is shown to be given, in cylindrical coordinates, by ds exp 2 = (dt + 4 omega /m exp 2 sinh exp 2 (mr)/2) d phi) exp 2 - 1/m exp 2 sinh exp 2 (mr) d phi exp 2 - dr exp 2 - dz exp 2 , where omega is the vorticity and - infinity < = m exp 2 < = + infinity, m exp 2 = 2 omega exp 2 corresponding to the Godel metric. Sources of Einstein equations leading to these metrics as solutions are examined and it is shown that the inclusion of a scalar field extends the previously known region of solutions - infinity < = m exp 2 < = 2 omega exp 2 to - infinity < = m exp 2 < = 4 omega exp 2 . The problem of ambiguity of physical sources of the same metric and that of violation of causality in Godel-type ST-homogeneous universes are examined. In the case m exp 2 = 4 omega exp 2 the first exact Godel-type solution of Einstein equations describing a completely causal ST-homogeneous rotating universe is obtained. (Atomindex citation 16:007467)

536,887

DE85700463/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Geometry as an Aspect of Dynamics.
A. L. L. Videira, A. L. R. Barros, and N. C. Fernandes. Jun 82, 20p IFUSP-P-340
U.S. Sales Only.

It is shown how the introduction from the onset, in a general differentiable space-time manifold, of a certain well defined minimal set of fundamental dynamical quantities allows the specific geometric structure of that manifold to be fixed. (Atomindex citation 16:007468)

536,888

DE85700464/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Elementary Particle Physics, Phase Transitions and Cosmology.
G. C. Marques. Aug 83, 26p IFUSP-P-425
In Portuguese.
U.S. Sales Only.

An overview about some problems in cosmology which has lead to an overlapping with others areas mainly, elementary particles and phase transition phenomena is made. (Atomindex citation 16:007469)

536,889

DE85700465/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Static Plane Symmetric Scalar Fields with a Traceless Energy-Momentum Tensor in General Relativity.
A. N. Vaidya, and M. M. Som. 1982, 10p UFRJ-IF-02/82
U.S. Sales Only.

The problem of zero-mass scalar fields coupled to the gravitational field in the static plane symmetric case, is completely solved for a traceless energy-momentum tensor. (Atomindex citation 16:007470)

536,890

DE85700466/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Generalized Electrovacs.
E. P. Vasconcellos, and M. M. Som. 1982, 14p UFRJ-IF-08/82
U.S. Sales Only.

The static solutions of the Einstein-Maxwell equations coupled with the zero rest mass scalar field in a space-time admitting a time-like and two space-like killing vector fields are obtained based on the assumption that the gravitational and electrostatic potentials are functionally related with the scalar potential. The solutions include the plane-symmetric solutions as a particular case. The cylindrically symmetric solutions can be obtained by suitably choosing one of the spatial coordinates as azimuthal coordinate. The transformations are obtained which lead to Taub's coordinate in the case planar symmetry and to Weyl's canonical coordinates in the case of cylindrical symmetry. (Atomindex citation 16:007471)

536,891

DE85700467/GAR PC **A02**/MF **A01**
Universidade Federal do Rio de Janeiro (Brazil). Inst. de Fisica.
Static Conformally Invariant Scalar Field.
A. J. Accioly, A. N. Vaidya, and M. M. Som. 1982, 9p UFRJ-IF-09/82
U.S. Sales Only.

For a massless conformally invariant scalar field, a class of solutions is obtained to the Einstein equations for which the geometry of the space-time admits one time-like and two space-like Killing vectors. The class of solutions admit plane-symmetric and conformally flat solutions as special cases. The metrics can be interpreted as static cylindrically symmetry solutions if one of the space-like Killing vectors is associated with the rotational motion. (Atomindex citation 16:007472)

536,892

DE85700468/GAR PC **A02**/MF **A01**
Vienna Univ. (Austria).
Equivalence of Electromagnetic and Clock-Transport Synchronization in Noninertial Frames and Gravitational Fields.
H. Rumpf. 1984, 5p UWThPh-84-37
U.S. Sales Only.

Synchronization by slow clock transport is shown to be equivalent for electromagnetic signals for clocks moving along the trajectories of a timelike Killing vector field, provided the gravitational redshift is corrected for and the synchronization paths are the same. (Atomindex citation 16:007473)

536,893

DE85700469/GAR PC **A02**/MF **A01**
Vienna Univ. (Austria).
Simple Proof of the Generalized Electrostatic Israel Theorem.
W. Simon. 1984, 9p UWThPh-84-38
U.S. Sales Only.

A simple proof of a generalization of the theorem of Israel concerning the uniqueness of the Reissner-Nordstroem black holes is presented. The present method is also applied to show, in the bosonic sector of N = 4-supergravity, the uniqueness of a static black hole solution found by Gibbons. (Atomindex citation 16:007474)

536,894

DE85700471/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Scaling Equations of the Coupling Constants for the One-Dimensional Two-Fermion Model.
M. Apostol, V. Barsan, and C. Mantea. Aug 84, 23p IC-84/108
U.S. Sales Only.

Jordan's boson representation and cut-off regularization procedure for the one-dimensional two-fermion model is used to get the equivalence with the two-dimensional Coulomb gas and sine-Gordon model. The scaling equations of the coupling constants to third-order are obtained thereby, which slightly differ from those reported in the literature. The scaling of the model onto the exactly soluble models is discussed. (Atomindex citation 16:007518)

536,895

DE85700472/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Low-Energy beta -Function in a Finite Super-Yang-Mills Model with Multiple Mass Scales.
O. Foda, and J. A. Helayel-Neto. Aug 84, 20p IC-84/127
U.S. Sales Only.

We compute the one-loop contribution to the low-energy light-fermion gauge coupling in a finite supersymmetric gauge theory with two mass scales: a heavy mass that breaks an initial N=4 supersymmetry down to N=2, but respects the finiteness, and a light mass that, for simplicity, is set to zero. We find that the coupling grows with the mass of the heavy intermediate states. Hence the latter do not decouple at low energies, leading to large logarithms that invalidate low-energy perturbation theory. Consequently, further manipulations are required to obtain a meaningful perturbative expansion. Enforcing decoupling through finite renormalizations, that absorb the heavy mass effects into a redefinition of the parameters of the Lagrangian, introduces an arbitrary subtraction mass mu . The requirement that the S-matrix elements be independent of mu leads to a non-trivial renormalization-group equation for the low-energy theory, with a non-vanishing beta -function. (Atomindex citation 16:007519)

536,896

DE85700473/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Supersymmetric Four-Fermion Interactions.
E. Mahdavi. Apr 84, 17p IC-84/37
U.S. Sales Only.

Supersymmetric generalization of the four-fermion interactions in one spatial and one time dimension is studied. In order to supersymmetrize the four-fermion interaction models, such as Gross-Neveu or Thirring models, it turns out that one needs to introduce a super-current which contains covariant derivative of superfield in its structure, and the Lagrangian constructed from this super-current, therefore, has derivative couplings in the interaction. It is shown that the supersymmetric Gross-Neveu model up to one loop is finite and the ultra-violet overlapping divergences of two loop cancel each other. (Atomindex citation 16:007520)

536,897

DE85700474/GAR PC **A02**/MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
S-Wave SU(5) Monopole-Fermion System Reduces to a Coupled Set of Exactly Solvable QFTs.
N. S. Craigie, and W. Nahm. Jul 84, 9p IC-84/79
U.S. Sales Only.

By establishing that the SU(2)-colour sector of fermions in the SU(5) 't Hooft-Polyakov monopole system has an underlying SU(2) Kac-Moody algebra with central charge unity, we show for massless fermions that the whole system can be reduced to a coupled set of exactly integrable two-dimensional QFT's in radial space. Consequently all the non-perturbative effects in the Green functions governing baryon number non-conservation can be explicitly computed up to the effect of the ordinary QCD confining vacuum, which is relevant only at long distances from the monopole's core. (Atomindex citation 16:007521)

536,898

DE85700475/GAR PC **A06**/MF **A01**
Instituto de Fisica Teorica, Sao Paulo (Brazil).
Differential Formalism Aspects of the Gauge Classical Theories.
E. Stedile. 1982, 119p IFT-M-01/82
In Portuguese.
U.S. Sales Only.

The classical aspects of the gauge theories are shown using differential geometry as fundamental tool. Some comments are done about Maxwell Electro-dynamics, classical Yang-Mills and gravitation theories. (Atomindex citation 16:007522)

536,899
DE85700478/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Vacuum Decay in a Soluble Model.
A. F. de Camargo Filho, R. C. Shellard, and G. C. Marques. Mar 83, 31p IFUSP-P-386, IFT-P-12/82
U.S. Sales Only.

A field-theoretical model is studied, where the decay rate of the false vacuum can be computed up to the first quantum corrections in both the high-temperature and zero-temperature limits. It is found that the dependence of the decay rate on the height and width of the potential barrier does not follow the same simple area rule as in the quantum-mechanical case. Furthermore, its behaviour is strongly model-dependent. (Atomindex citation 16:007525)

536,900
DE85700479/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Some Features of Cp Sup(n-1) Models with Fermions.
E. Abdalla, and A. Lima-Santos. Sep 83, 11p IFUSP-P-430
U.S. Sales Only.

The bound state S-matrix of the Cp sup(n-1) model coupled to fermions in a minimal or supersymmetric way, is presented and the relation to the low energy features in the supersymmetric case is discussed. (Atomindex citation 16:007526)

536,901
DE85700480/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Dynamical Mass Generation for the Gravitino in Simple N=1 Supergravity.
R. S. Jasinschi, and A. W. Smith. Dec 83, 11p IFUSP-P-444
U.S. Sales Only.

It is shown that the gravitino mass can be dynamically generated in the simple N=1 supergravity because of the presence of quartic scalar gravitino interaction term. (Atomindex citation 16:007527)

536,902
DE85700481/GAR PC **A02**/MF **A01**
Karl-Marx-Univ., Leipzig (German D.R.). Sektion Physik.
Test of a Hamiltonian Variational Method for SU(3) Lattice Gauge Theory in 3+1 Dimensions.
M. Hellmund. Oct 83, 14p KMU-HEP-83-10
U.S. Sales Only.

A Hamiltonian variational procedure is discussed for lattice gauge theories, suitable for 3+1 dimensions, based on a trial state vector in terms of link variables. This method has been applied to the calculation of link and plaquette expactation values for the pure SU(3) lattice gauge theory. Agreement with Monte Carlo data is found only in part of the weak coupling cross over region. Taking some 2-link correlations in the trial state vector into account the results are improved in the cross over region and smear out an unwanted phase transition. (Atomindex citation 16:007531)

536,903
DE85700482/GAR PC **A03**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Phase Transition in an Abelian Gauge Theory at Finite Temperature.
D. Bazeia Filho, G. C. Marques, and I. Ventura. Mar 83, 26p IFUSP-P-388
U.S. Sales Only.

Within the context of an Abelian Gauge Theory, phase transition driven by the spontaneous generation of domain walls is discused. The critical temperature is calculated semiclassically. The results are very close to those obtained via the effective potential approach. (Atomindex citation 16:007627)

536,904
DE85700483/GAR PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Nonrelativistic Exact U(1) Symmetric S Matrix, and the Nonlinear Schroedinger Equation.
E. Abdalla, and A. Lima-Santos. May 83, 9p IFUSP-P-402
U.S. Sales Only.

The U(1) symmetric factorizable galilean invariant S matrices are related, to the exact solution of the nonlinear Schroedinger equation, using perturbation theory techniques and to some well known solutions of the Calogero system. (Atomindex citation 16:007628)

536,905
DE85700484/GAR PC **A02**/MF **A01**
Karl-Marx-Univ., Leipzig (German D.R.). Sektion Physik.
Quantization by Stochastic Relaxation Processes and Supersymmetry.
R. Kirschner. Jan 84, 6p KMU-HEP-84-01
U.S. Sales Only.

We show the supersymmetry mechanism resposible for the quantization by stochastic relaxation processes and for the effective cancellation of the additional time dimension against the two Grassmann dimensions. We give a non-perturbative proof of the validity of this quantization procedure. (Atomindex citation 16:007629)

536,906
PB85-185460/GAR PC **E03**/MF **E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Occurence on an Effective Anharmonic Velocity Dependent Potential,
J. M. F. Gunn. c1984, 25p RAL-84-100

An integrable dynamical problem of a classical neutral particle interacting with an inhomogeneous magnetic field via a magnetic dipole moment is considered, which had previously been studied quantum mechanically. The equation for the center of mass velocity is of second order resembling that of an anharmonic oscillator with velocity replacing position in the equation. The velocity undergoes curious oscillations, where the spin and center of mass degrees of freedom exchange energy, although there is also, in general, a uniform component to the velocity. An application to the motion of a classical 'neutron' in a magnetic domain wall is discussed, and comparison with previous quantum treatments are made. (Copyright (c) Science and Engineering Research Council 1984.)

536,907
PB85-186096/GAR PC **E04**/MF **E04**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Numerical Solution of Field Theories Using Random Walks,
T. Barnes, and G. J. Daniell. c1984, 27p RAL-84-106
Prepared in cooperation with Southampton Univ. (England).

It is shown how random walks in function space can be employed to evaluate field theoretic vacuum expectation values numerically. Specific applications which are studied are the two-point function, mass gap, magnetization (phi0 and classical solutions. This technique offers the promise of faster calculations using less computer memory than current methods.

536,908
PB85-190791/GAR PC **E03**/MF **E03**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Quantum Bound States Where the Classical Motion Is Unbounded,
J. M. F. Gunn. c1984, 17p RAL-84-104

An example of bound quantum states occurring where the classical motion is unbounded is given. It consists of a void in an otherwise perfect array of hard sphere scattering centers. The Hamiltonian consists only of kinetic energy and an interpretation is that the particle is bound in order to lower its kinetic energy is given, contrary to usual intuition. The calculation is also an unusual solid state physics problem. The physical situations where this may be relevant are mentioned. (Copyright (c) Science and Engineering Research Council 1984.)

20K. Solid Mechanics

536,909
AD-A153 475/9/GAR PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Role of Ellipticity and Normality Assumptions in Formulating Live-Boundary Conditions in Elasticity.
Technical summary rept.,
P. Podio-Guidugli, G. V. Caffarelli, and E. G. Virga. Feb 85, 16p Rept no. MRC-TSR-2788
Contract DAAG29-80-C-0041

It is shown that those interactions of an elastic body B with an elastic environment E manifested by local surfacial loadings should be modelled by boundary operators featuring a live system of surfacial forces, i.e., a vector field s, defined over the boundary partial derivative of B and representing the surfacial force per unit area exerted by E over B, which depends functionally in a non-trivial way on the deformation u of B. In addition to the analytical difficulties to be expected, when normality does not hold the mechanical interpretation of boundary conditions fails to be unique. That this is indeed the case is demonstrated by producing an explicit example in linearized elastostatics of a boundary operator condition of traction or as a dead-boundary condition of frictionless contact.

536,910
AD-A153 509/5/GAR PC **A05**/MF **A01**
Virginia Univ., Charlottesville. School of Engineering and Applied Science.
Studies on Surface Processes during Friction and Wear.
D. Kuhlmann-Wilsdorf. Mar 85, 76p
Contract N00014-83-K-0245

In the previous contract period, experimental as well as theoretical research has been carried out. The former has concentrated on the development of a novel testing apparatus which promises to reveal hitherto inaccessible details on the surface condition of materials during sliding. It employs simultaneous measurements of the coefficient of friction and the electrical contact resistance, using a soft set-up and following the momentary variations. This research has not yet yielded reportable results but progress is most encouraging. Theoretical work has been devoted to theory of plastic deformation. Of by far the greater interest in connection with the present contract theme, namely friction and wear and surface processes governing these, has been the research embodied in the two extensive papers which are appended herewith. As is seen from these, it has been possible to derive rather simple analytical, closed equations for the evaluation of the momentary temperature at contact spots during sliding. This theory has been extended to the case of concurrent friction and Joule heating, as presented in this paper, which has been submitted to the WEAR OF MATERIALS - 1985 conference. This document concentrates on de-mystifying flash temperatures.

536,911
AD-A153 519/4/GAR PC **A02**/MF **A01**
Umea Univ. (Sweden). Dept. of Psychology.
Interaction of Large Amplitude Stress Waves in Layered Elastic-Plastic Materials.
Final rept. Dec 81-Dec 84,
E. Varley. Feb 85, 7p ARO-18646.2-EG
Contract DAAG29-82-K-0027

Mathematical techniques are developed to analyze the nonlinear wave interactions that occur in both elastic and visco-plastic solids. Representations are also derived to describe small amplitude stress waves in materials whose transmitting properties vary in space and time. (Author)

536,912
AD-A153 530/1/GAR PC **A02**/MF **A01**
California Univ., Los Angeles. School of Engineering and Applied Science.
Statistical Fracture Theories for Brittle Materials.
Final rept.,
S. B. Batdorf, and G. Sines. 17 Jan 85, 11p
Contract N00014-76-C-0445

This document describes Statistical Fracture Theories for Brittle Materials.

536,913
AD-A153 543/4/GAR PC **A04/MF A01**
Aeronautical Research Labs., Melbourne (Australia).
Description and Illustration of the Use of Cracks IV.
Technical memo.,
C. S. Dentry. Aug 84, 62p Rept no. ARL/STRUC-TM-389

This Memorandum provides an explanation of the procedure required to implement the computer program CRACKS IV for the calculation of crack growth rates. The procedure is illustrated by means of sample calculations.

536,914
AD-A153 632/5/GAR PC **A03/MF A01**
Aeronautical Research Labs., Melbourne (Australia).
Stresses in a Half-Plane Containing Either a Pressurized Hole or an Interference-Fit Disc,
G. S. Jost. Jul 84, 28p Rept no. ARL-STRUC-R-409

Comparisons have been made of the theoretical stresses in a half-plane containing either a pressurized hole or an interference-fit disc. For a hole more than about three radii from the free edge the differences between the two cases become progressively more insignificant.

536,915
AD-A153 819/8/GAR PC **A02/MF A01**
Naval Research Lab., Washington, DC.
Theoretical Aspects of Fatigue and Creep Crack Growth,
K. Sadananda. 1984, 25p
Pub. in Advances in Fracture Research, p211-234 1984.

Theoretical aspects of crack growth behavior in fatigue and creep are examined in terms of micromechanisms of growth and macromechanical considerations. Fatigue crack growth curves in terms of threshold, near-threshold, Paris-law and rapid growth regimes, and various microprocesses that affect these regimes are discussed. Threshold and near-threshold regimes are affected by both intrinsic factors such as elastic modules, slip character, slip reversibility and microstructural heterogeneities, and extrinisic factors involving crack path tortuosity and crack closure. In the near-threshold and rapid crack growth regimes, the growth occurs by the cumulative damage processes wherein damage accumulation during several cycles is required for each increment in crack length. In the intermediate Paris-law regime growth generally occurs by the plastic blunting process. Behavior of short cracks and non-propagating cracks are discussed briefly. Crack growth in creep is discussed in terms of relative kinetics of the stress relaxation processes involving creep of the material ahead of the crack tip as well as the crack tip blunting process, and the damage accumulating processes involving void nucleation and growth and formation of microcracks ahead of the main crack. Recent developments in the parametric analysis and in the theoretical modelling of creep crack growth are briefly outlined in this reprint. (Author)

536,916
PB85-191450/GAR PC **A09/MF A01**
California Univ., Richmond. Earthquake Engineering Research Center.
Refined Physical Theory Model for Predicting the Seismic Behavior of Braced Steel Frames,
K. Ikeda, and S. A. Mahin. Jul 84, 196p UCB/EERC-84/12, NSF/CEE-84023
Grant NFS-CEE82-06079

This report presents a state-of-the-art model for inelastic response analysis of braced steel structures. This model achieves realism and efficiency by combining analytical formulations describing plastic hinge behavior with empirical formulae based on experimental data. Several empirical behavioral characteristics are implemented in this modeling including (1) the variation of the tangent modulus of elasticity during cycles, (2) the gradual plastification process of the plastic hinge, and (3) the residual displacement due to material nonlinearities in the nominal elastic range. Verification of the new model is performed on the basis of quasi-static analyses of individual struts and dynamic response analyses of a three-story X-braced steel frame, representative of offshore platforms. The model is applied to the study of the design of a real sized six-story K-braced steel building frame.

536,917
PB85-193829/GAR PC **E03/MF E03**
Commission of the European Communities, Luxembourg.
Procedure to Follow for the Fatigue Verification in the Case of Stresses Due to Thermal Skin Effect,
V. Renda. c1984, 29p EUR-9334-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The aim of this work is to analyze and discuss the procedures that must be applied to perform a fatigue evaluation, in agreement with ASME-III/NB, for thermal skin effect loading condition. Special attention is given to the analysis of the stress concentration factor near a geometric discontinuity in the case of the thermal skin effect loading condition.

536,918
PB85-195204/GAR PC **E03/MF E03**
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
Second Order Tensor Invariants in Continuum Mechanics Using the Lagrangian Formulations,
J. C. Grossetie. c1984, 34p EUR-9165-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The paper presents for second order tensors a simple account of invariant theory from the point of view of its application to continuum mechanics. It is demonstrated that working with the tensors themselves instead of working with their components exclusively, leads not only to certain added convenience in manipulation, but also to enhanced understanding of the concepts of eigenvalues, eigenvectors and invariants of second order tensors. In addition, it is shown that in general curvilinear coordinate systems (Lagrangian point of view in continuum mechanics) the classical computer techniques can be applied provided the mixed tensor components are used. In particular invariants, eigenvalues and eigenvectors are explicit functions of the deformation process that the curvilinear coordinate system is undergoing. Finally, a general numerical scheme is given in order to be used and implemented in a computer code. (Copyright (c) ECSC-EEC-EAEC, Brussels, Luxembourg, 1984.)

20L. Solid-State Physics

536,919
AD-A153 406/4/GAR PC **A02/MF A01**
Colorado State Univ., Fort Collins.
Growth Mechanism and Properties of the Thermal and Anodic Oxides of the III-V Compound Semiconductors.
Final rept. 17 Dec 81-13 Dec 84,
C. W. Wilmsen. Mar 85, 14p ARO-18330.9-EL
Contract DAAG29-82-K-0032

The mechanisms of oxide growth on InP, GaP, GaAs, and InGaAs were investigated and their electrical properties measured. Islands were observed as the initial stage of anodization of InP and GaAs but the details of the growth on the two materials are different. The thermal oxides of InP and GaP also differ in composition and surface topography. InP forms bubbles and GaP has pits under the oxide. Traps at the deposited insulator/InP interface were also investigated.

536,920
AD-A153 425/4 Not available NTIS
American Inst. of Physics, New York.
Proceedings of the Annual Conference on Magnetism and Magnetic Materals (30th) Held at San Diego, California on 27-30 November 1984. Part A,
N. C. Koon, and D. L. Huber. 30 Nov 84, 690p
See also Part B, AD-A153 426.
Availability: American Institute of Physics, 335 East 45th St., New York, N. Y. 10017. HC $80.00 (No copies furnished by DTIC/NTIS).

Contents: Magnetism: Present and Future; Itinerant Magnetism I; Itinerant Magnetism II; Heavy Fermion Superconductivity; Magnetic Superconductors and Heavy Fermions; Magnetic Superconductors; Mixed Valence I; Mixed Valence II; Mixed Valence, Magnetic Semiconductors and Magnetic Superconductors; Transport and Magnetic Semiconductors; Intermetallic Compounds, Alloys and Other Materials; Critical Phenomena and Random Fields; Critical Phenomena I; Critical Phenomena II; Spin Glass Symposium; Spin Glasses I; Spin Glasses II; Spin Glasses III; Amorphous Materials I; Amorphous Materials II; Amorphous Materials III; Amorphous Materials IV; Synchrotron Radiation and Magnetism; and Magnetic Surfaces and Electron Spectroscopy.

536,921
AD-A153 426/2 Not available NTIS
American Inst. of Physics, New York.
Proceedings of the Annual Conference on Magnetism and Magnetic Materials (30th) Held at San Diego, California on 27-30 November 1984. Part B,
N. C. Koon, and D. L. Huber. 30 Nov 84, 674p
See also Part A, AD-A153 425.
Availability: American Institute of Physics, 335 East 45th St., New York, N. Y. 10017. HC $80.00 (No copies furnished by DTIC/NTIS).

Contents: Superlattices and Interfaces; Multilayers: Excitations; Ferromagnetic Resonance; Magnetostriction, Resonance and Magnetostatic Modes; Neutron Scattering and Magnetic Excitations; Novel Techniques in Neutron Scattering; New Techniques, New Applications, Interdisciplinary Subjects; Field Computations I; Field Computations II; Magneto-optics; Magneto-optical Recording Workshop; Magnetic Recording I; Magnetic Recording II; Magnetic Recording III; Magnetic Recording IV; Bubbles I: Materials; Bubbles II: Physics and Devices; Permanent Magnet Workshop; Hard Magnetic Materials I; Hard Magnetic Materials II; Soft Magnetic Materials I; Soft Magnetic Materials II; Soft Magnetic Materials III; Ferrofluids: Fine Particles and Magnetic Separation.

536,922
AD-A153 552/5 Not available NTIS
IBM Thomas J. Watson Research Center, Yorktown Heights, NY.
Fractionally Quantized Hall Effect in Two-Dimensional Systems of Extreme Electron Concentration,
E. E. Mendez, L. L. Chang, M. Heiblum, and L. Esaki. 15 Dec 84, 4p ARO-18683.37-PH
Contract DAAG29-81-C-0038
Availability: Pub. in American Physical Society v30 n12 p7310-7312 1984. (No copies furnished by DTIC/NTIS).

We report magnetotransport measurements, down to 0.050 K and up to 20 T, in two-dimensional systems with dilute and dense electron densities. The emphasis is on the latter regime, where the Hall resistance shows quantization for level filling factors at $\nu=4/3$ and 5/3, and the magnetoresistance presents well-defined structures at $\nu=7/3$ and 8/3. These results indicate that the fractional quantum Hall effect is a general phenomenon not restricted to the lowest-orbital Landau level.

536,923
AD-A153 553/3 Not available NTIS
Illinois Univ. at Urbana-Champaign. Coordinated Science Lab.
Transient Electronic Transport in InP Under the Condition of High-Energy Electron Injection.
K. Brennan, K. Hess, J. Y. F. Tang, and G. J. Iafrate. Dec 83, 6p ARO-17687.16-EL
Contracts DAAG29-80-K-0069, N00014-77-C-0537
Availability: Pub. in IEEE Transactions on Electron Devices, vED-30 n12 p1750-1754 Dec 83 (No copies furnished by DTIC/NTIS).

Transient tranport of electrons in InP is studied under the condition of high-energy electron injection. This study makes use of a Monte Carlo simulation with the unique inclusion of realistic band structure as derived from an empirical pseudopotential method. The results obtained herein for InP are qualitatively similiar to those previously obtained by the authors for GaAs. Qualitatively, it was found that ultra-high electron drift velocities (approx. 10 to the 8th power/cm/s) persist for much higher electron fields and over much longer distance of electron traveral in InP as compared to GaAs.

536,924
AD-A153 559/0/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.

Effects of Subgrain Boundaries on Carrier Transport in Zone-Melting-Recrystallized Si Films on SiO2-Coated Si Substrates.
Journal Article,
B Y. Tsaur, J. C. C. Fan, M. W. Geis, D. J. Silversmith, and R. W. Mountain. Apr 82, 5p JA-5295, ESD-TR-85-055
Contract F19628-80-C-0002
Pub. in IEEE Electronic Device Letters, vEDL-3 n4 p79-82, Apr 82.

The transport properties of zone-melting-recrystallized Si films on SiO2-coated Si substrates have been studied by the fabrication and characterization of thin-film resistors and n-channel MOSFET's. Subgrain boundaries, which are the predominant crystal defects in the films, have a relatively low trapping state density (7-8 x 10 to the 11th power/(sqcm) and low resistance. N-channel MOSFET's fabricated in the films exhibit high surface electron mobilities (approx. 640 (sqcm/V-s) for electron transport either parallel or perpendicular to the subgrain boundaries.

536,925
AD-A153 664/8/GAR PC **A06**/MF **A01**
Erlangen-Nuernberg Univ. (Germany, F.R.). Inst. fuer Angewandte Physik.
Electronic States in Silicon and on Its Interfaces.
Final technical rept. Dec 80-Mar 84,
M. Schulz, K. Hofmann, G. Pensl, and K. H. Hoelzlein. Jan 85, 102p
Contract DAJA37-81-C-0002

The report contains two separate sections: (1)Properties of the new oxygen donor' in silicon and (2)Process-induced interface and bulk states in MOS structures. (1): The so-called new oxygen donor defect is formed in Czochvalski-grown silicon during annealing at temperatures around 650 C. The general properties are explained by SiO sub x precipitates in bulk silicon. The trap spectrum observed is an interface state spectrum for these oxide inclusions. (2): The effect of processing on the generation of interface states and bulk silicon traps is analyzed in MOS structures. Simple VLSI process steps are simulated by postoxidation annealing in the temperature range T=600 - 1150 C. Interface and bulk states are strongly generated for anneal temperatures below 900 C. The bulk silicon trap density steeply increases within 100nm from the interface.

536,926
AD-A153 689/5/GAR PC **A03**/MF **A01**
Aerospace Corp., El Segundo, CA. Chemistry and Physics Lab.
Photochemical Oxidation of GaAs.
Technical rept.,
P. A. Bertrand. 11 Mar 85, 27p TR-0084A(5945-06)-2, SD-TR-85-09
Contract F04701-83-C-0084

The vacuum ultraviolet photochemical oxidation of GaAs by N2O (wavelengths of 2537 A and 1849 A) was studied by X-ray photoelectron spectroscopy. We believe the model most consistent with our data involves (1) adsorption of molecular N2O, (2) dissociation of the N2O on the surface, and (3) oxidation of the surface by the adsorbed O atoms. The temperature dependence of the overall reaction on the stoichiometric surface is dominated by the temperature dependence of adsorption of N2O. As As-rich surface oxidizes more slowly, and the reaction saturates; in this case the rate-limiting step and the cause of saturation is the oxidation of the surface by adsorbed O atoms. The As-covered surface does not present the proper sites (As atoms surrounded by Ga atoms) for fast, continued oxidation of GaAs.

536,927
AD-A153 720/8/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Microsecond Carrier Lifetimes in Si Films Prepared on SiO2-coated Si Substrates by Zone-Melting Recrystallization and by Subsequent Epitaxial Growth.
Journal article,
B. Y. Tsaur, J. C. C. Fan, and M. W. Geis. 1 Jul 82, 4p JA-5319, ESD-TR-85-065
Contract F19628-80-C-0002
Pub. in Applied Physics Letters, v41 n1 p83-85, 1 Jul 82.

The generation lifetimes in zone-melting-recrystallized Si films on Si02-coated Si substrates and in epitaxial Si layers grown by chemical vapor deposition on the recrystallized films have been determined by pulsed metal-oxide-semiconductor (MOS) capacitor and p-n junction leakage current measurements. For recrystallized Si films that are 10 to the 17th power/cc n type and 10 to the 16th power/cc p type, respectively, the lifetimes are 0.2-0.5/microseconds and approx. 1/microsecond(s). For epitaxial Si layers that are 2x10 to the 15th power/cc n type, lifetimes are 0.8-1.3/microseconds, compared to approx. 2 microsecond(s) for control layers grown on single-crystal Si (100) wafers. The relatively high lifetimes suggest the possibility of fabricating bipolar devices utilizing Si-on-insulator structures prepared by the present techniques.

536,928
AD-A153 722/4/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Stimulated Surface-Plasma-Wave Scattering and Growth of a Periodic Structure in Laser-Photodeposited Metal Films.
Journal article,
S. R. J. Brueck, and D. J. Ehrlich. 14 Jun 82, 5p JA-5328, ESD-TR-85-071
Contract F19628-80-C-0002, Grant NSF-ECS84-04632
Pub. in Physical Review Letters, v48 n24 p1678-1681, 14 Jun 82.

No abstract available.

536,929
AD-A153 725/7/GAR PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
High-Field Electron Capture and Emission in Nitrided Oxides.
Journal article,
F. L. Terry, P. W. Wyatt, M. L. Naiman, B. P. Mathur, and C. M. Kirk. 15 Mar 85, 5p JA-5684, ESD-TR-85-179
Contract F19628-80-C-0002
Pub. in Jnl. of Applied Physics, v57 n6 p2036-2039, 15 Mar 85.

High-field, constant current injection has been used to study electron trapping and reemission processes in ammonia-annealed (nitrided) silicon dioxide. The gate voltage during injection versus injected charge exhibits two rates. The first provides the capture cross section and trap density information. The second provides information on reemission of trapped charge by tunneling. From the tunneling data, the electron trap depth can be estimated to be 3.5-4 eV below the insulator conduction band. Nitrogen annealing reduces the density of these traps.

536,930
DE85007987/GAR MF **A01**
Argonne National Lab., IL.
Magnetism at Interfaces and Surfaces, as Probed by Neutron Scattering.
G. Felcher. Dec 84, 13p CONF-8407117-1
Contract W-31-109-ENG-38
Course on dynamical phenomena at surfaces, interfaces and superlattices, Erice, Italy, 1 Jul 1984.
Microfiche only, copy does not permit paper copy reproduction.

The diffraction of polarized neutrons from metal-metal superlattices, with one of the two metals magnetic, has yielded significant information on the microscopic distribution of magnetism, although the ultimate possibilities of the technique are yet sample-limited. Fresnel reflection of polarized neutrons from superconductors and ferromagnets is providing the depth profile of the magnetization close to the surface of these materials. (ERA citation 10:022835)

536,931
DE85008729/GAR PC **A03**/MF **A01**
Harvard Univ., Cambridge, MA. Div. of Applied Sciences.
Drift Mobilities by Time-of-Flight Methods and Time-Dependent Photottransport in the Nanosecond Regime in Amorphous Semiconductors. Annual Report, May 1, 1984-April 30, 1985.
W. Paul. Mar 85, 31p DOE/ER/45070-1
Contract FG02-84ER45070

The purpose of this work is to elucidate transient phototransport and related phenomena in amorphous semiconductors, which have a bearing on the steady-state photoelectronic properties and the underlying electronic band structure. The approach has been to produce samples of a-Si:H and a-Si:H:F, to characterize them very well chemically, structurally and optically, and then to study the dispersive transport by the time-of-flight technique. This gives information on the mode of transport in these disordered substances. By studying the collected charge versus applied electric field on intrinsic and doped samples, one is also able to obtain information on the electron and hole lifetimes for deep trapping as a function of the position of the Fermi level, and thereby on the energetic position of the neutral and negatively-charged dangling bond states and on the modifications to the density-of-states in the conduction and valence band tails by the various dopants. These results are important both for fundamental understanding of this class of semiconductors and for improvement of devices based on them for solar cell and thin film transistor applications. (ERA citation 10:022520)

536,932
DE85009227/GAR PC **A04**/MF **A01**
Ames Lab., IA.
Study of the Fundamental Absorption Edge in W/sub 1-X/Mo/sub X/Se sub 2 Semiconducting Compounds.
C. L. Chang. Mar 85, 53p IS-T-1059
Contract W-7405-ENG-82
Thesis.

Measurements on the absorption edge of W/sub 1-x/Mo/sub x/Se sub 2 system were found to agree quite well with the theory of indirect electronic transitions from the valence band to the conduction band accompanied by the absorption and emission of phonons. This study of the absorption edge establishes reasonably well the fact that the W/sub 1-x/Mo/sub x/Se sub 2 system has an indirect gap and yields useful values for the energy gap as a function of temperature. Although no fine structure due to the absorption and emission of more than one phonon was observed, the phonon energy of about 0.025 eV obtained from the one-phonon Macfarlane-Roberts analysis does represent an average phonon energy for the interband transitions in W/sub 1-x/Mo/sub x/Se sub 2 system. The analysis of the absorption edge also yielded values for the energy gap as a function of temperature and composition. (ERA citation 10:021229)

536,933
DE85009811/GAR PC **A02**/MF **A01**
Northwestern Univ., Evanston, IL. Dept. of Physics and Astronomy.
Local Density Theory of Heats of Formation and Short-Range Order Parameters in Substitutionally Disordered Alloys. First Year Report.
A. J. Freeman, and A. Gonis. 1985, 4p DOE/ER/45080-T1
Contract FG02-84ER45080

Objective is to calculate short-range-order effects and phase diagrams in substitutionally disordered alloys of transition metals and actinides. During this period, a general unified method was formulated for calculating the Green functions associated with atoms in crystalline matter displaced from the regular lattice positions. (ERA citation 10:023278)

536,934
DE85010022/GAR PC **A02**/MF **A01**
Missouri Univ.-Kansas City.
Theoretical Studies on the Structures of Insulating and Metallic Glasses. Annual Progress Report, July 1, 1984-June 30, 1985.
W. Y. Ching. Jan 85, 13p DOE/ER/45170-1
Contract FG02-84ER45170

The major accomplishments covered in this report are: (1) Successful completion of a study on the band structures of all polycrystalline forms of silicon dioxide. (2) Study of electronic structure of Si/sub x/Ge/sub 1-x/ semiconductor solid solutions. (3) An investigation of crystalline lithium metasilicate and lithium disilicate through structural analysis and band structure calculation. (4) Preparation of canonical potentials and basis functions for all transition metal elements to be used in the electronic structure calculation of metallic glasses. (5) Comparative study of the electronic structures of crystalline Ni sub 3 P and amorphous Ni sub 75 P sub 25 glass. (ERA citation 10:022905)

536,935
DE85700488/GAR PC **A02**/MF **A01**
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.

Exact Results on the One-Dimensional Potts Lattice Gas.
R. Riera, and C. M. G. F. Chaves. Dec 82, 16p PUC-TN-22/82
U.S. Sales Only.

An exact calculation of the Potts Lattice Gas in one dimension is presented. Close to T=O deg K, the uniform susceptibility presents an essential singularity, when the exchange parameter is positive, and a power law behaviour with critical exponent gamma =1, when this parameter is negative. (Atomindex citation 16:007684)

536,936
DE85700489/GAR PC A02/MF A01
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Optical Absorption of Triplet Molecular Excitons in Alkali Cyanides.
S. S. Camargo Junior, and J. P. von der Weid. Jul 82, 10p PUC-TN-10/82
U.S. Sales Only.

The optical absorption spectra of alkali cyanides in the UV region present a set of weak absorption bands which are identified as triplet a' exp 3 sigma exp + molecular excitons. The nature of the molecular exciton transitions in the ionic-molecular crystals is discussed and the existence of an admixture between molecular exciton and charge transfer exciton states is suggested. (Atomindex citation 16:007738)

536,937
DE85700490/GAR PC A02/MF A01
Pontificia Univ. Catolica do Rio de Janeiro (Brazil). Inst. de Fisica.
Coupling Between Molecular and Charge Transfer Excitations in Mixed Alkali Halide-Cyanide Crystals.
S. S. Camargo, and J. P. von der Weid. Aug 82, 14p PUC-TN-12/82
U.S. Sales Only.

The optical absorption spectra of mixed alkali halide cyanide crystals (M(CN) sub(x) Y sub(1-x) where M = Na, K, Rb and Y = F, Cl, Br, I) were meesured at temperatures ranging from 300K down to 4.2K and CN exp - concentrations from 10 exp -2 % up to pure cyanide crystals. The absorption cross sections of the parity forbidden X sup(1) sigma exp + implies a' exp 3 sigma exp + vibronic transition of the CN exp - molecular ions were found to present a strong, non linear dependence on the x-composition of the mixed crystal as well as on the halide ion. This behaviour is explained by the coupling of the triplet molecular excitations to singlet charge transfer excitations in their neighbourhood. The experimental data were fit with a coupling energy of a few meV, depending mainly on the type of excitations involved (localized or collective) and not on the particular halide ion. The coupling mechanism is discussed and it is found to be due to the overlap between the wave functions of the two excitations. (Atomindex citation 16:007739)

536,938
DE85700493/GAR PC A02/MF A01
International Centre for Theoretical Physics, Trieste (Italy).
Effective Mass Theory for Shallow Donors in Many Valley Semiconductors.
S. Balasubramanian, and M. Tomak. Jul 84, 12p IC-84/74
U.S. Sales Only.

The extensions to the conventional effective-mass theory for shallow donors in Si, proposed by Altarelli and Hsu on the one hand and Resta and Resca on the other, are examined in detail. A variational expression for the donor ground state energy is given including the effect of a band nearer to the conduction band minimum. The different contributions to the donor ground state in Si are discussed. (Atomindex citation 16:007859)

536,939
DE85700494/GAR PC A02/MF A01
International Centre for Theoretical Physics, Trieste (Italy).
Surface Polariton Propagation Along an Interface Between Two Metallized Surfaces.
J. S. Nkoma. Jul 84, 16p IC-84/76
U.S. Sales Only.

Surface polaritons which propagate along an interface between two metallized surfaces are studied. The expressions for the dispersion relation, Poynting vector, energy density, energy velocity and the damping function are derived by electromagnetic theory. All these quantities are found to be frequency dependent and size dependent. Results are illustrated by a metal-vacuum-GaP-metal system. (Atomindex citation 16:007860)

536,940
DE85700495/GAR PC A02/MF A01
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Fully Anisotropic Triangular Lattice Quenched Bond-Random Potts Ferromagnet : Almost Exact Critical Frontier.
C. Tsallis. 1982, 11p CBPF-NF-021/82, CONF-820929-15
IUPAP international conference on magnetism, Kyoto, Japan, 6 Sep 1982.
U.S. Sales Only.

Through convenient duality and star-triangle-type generalized transformations, a (presumably excellent for 1 < = q < = 4) approximate phase diagram for the fully anisotropic triangular lattice quenched bond-random q-state Potts ferromagnet is obtained. Several exact particular results are recovered; a small error is however present in one of the limiting slopes. (Atomindex citation 16:007872)

536,941
DE85700498/GAR PC A02/MF A01
International Centre for Theoretical Physics, Trieste (Italy).
Note on D-Dimensional Ising Model, S=1/2, with Field.
K. Kulakowski. Jul 84, 6p IC-84/82
U.S. Sales Only.

Some approximate formulae are presented for the statistical potential omega of d-dimensional Ising spin system, S=1/2, in a magnetic field. Only finite clusters are considered. (Atomindex citation 16:007877)

536,942
DE85700503/GAR PC A02/MF A01
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Hyperfine Field at Ge in Fe.
A. Hrynkiewicz, J. C. Acquadro, E. W. Cybulska, M. N. Rao, and R. V. Ribas. Sep 83, 5p IFUSP-P-426
U.S. Sales Only.

The results of a remeasurement of the hyperfine magnetic field at sup 67 Ge in an iron host are reported. (Atomindex citation 16:007882)

536,943
DE85700507/GAR PC A02/MF A01
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Hyperfine Field at Na in Fe.
A. Hrynkiewicz, R. V. Ribas, M. N. Rao, E. W. Cybulska, and W. A. Seale. Dec 83, 6p IFUSP-P-441
U.S. Sales Only.

The results of Time Dependent Pertubed Angular Correlation (TDPAC) measurements for sup 22 Na recoil nuclei implanted into magnetized iron are reported. (Atomindex citation 16:007886)

536,944
PB85-187508/GAR PC E05/MF E05
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
More Seminars on Muonium Spectroscopy,
S. F. J. Cox. c1984, 77p RAL-84-116

Topics discussed include the following: Muons, muonium, and the Muon spin rotation technique; Muon spin rotation studies in magnetism; Muons in metals and metal hydrides; Muonium in semiconductors; Muon spin rotation studies in chemistry.

536,945
PB85-861938/GAR PC N01/MF N01
National Technical Information Service, Springfield, VA.
Amorphous Silicon Thin Films. 1970-June 1985 (Citations from the Engineering Index Data Base).
Rept. for 1970-Jun 85.
Jun 85, 249p
Supersedes PB84-868009.

This bibliography contains citations concerning properties, substrate compatibility, testing, structure and electronic applications of amorphous silicon thin films. Methods for the deposition of silicon semiconducting films, such as, sputtering, vapor deposition, and glow discharges are discussed. Optical and electrical properties relative to solar cell applications and the preparation of hydrogenated amorphous silicon thin films are considered. (This updated bibliography contains 352 citations, 113 of which are new entries to the previous edition.)

20M. Thermodynamics

536,946
DE85700516/GAR PC A03/MF A01
International Centre for Theoretical Physics, Trieste (Italy).
Microscopic Approach to Critical Behaviour in sup 3 He- sup 4 He Mixtures (II). Thermodynamics of the Effective Hamiltonian.
K. K. Singh, and P. Goswami. Aug 84, 26p IC-84/126
U.S. Sales Only.

Thermodynamics of a weakly interacting fermion-boson mixture has been worked out on the basis of the effective Hamiltonian derived in an earlier paper. Tricritical point behaviour is discussed in terms of the fields (T, mu sub 3 , mu sub 4). For the degenerate phase of the mixture, the theory reproduces the classical Landau expansion near a tricritical point. For the non-degenerate phase, the theory differs materially from the Landau theory; it predicts tricritical exponents in agreement with those calculated by applying renormalization group theory to phenomenological models, and a slope for the upper line larger than that of the lambda-line in the chi-T plane. (Atomindex citation 16:008631)

20N. Wave Propagation

536,947
AD-A153 827/1/GAR PC A04/MF A01
Maryland Univ., College Park.
Experimental and Theoretical Investigation of Microwave and Millimeter Wave Radiation from Hollow, Rotating Electron Beams.
Annual progress rept. 1 Dec 83-30 Nov 84,
W. W. Destler. 30 Dec 84, 58p AFOSR-TR-85-0408
Grant AFOSR-83-0013

Studies of the production of microwave and millimeter wave radiation from rotating electron beams have been pursued at the University of Maryland under AFOSR sponsorship since 1978. In the period 1978-1981, these studies centered the broadband radiation produced when a rotating electron beam interacts with the TE and/or TM modes of a smooth cylindrical conducting boundary system. These early studies led in 1981 to the first demonstration of a new type of coherent radiation source at microwave and millimeter wave wavelengths with demonstrable advantages over existing sources. This device, informally called a Cusp Injected Magnetron of Cusptron by members of our group, produces radiation by the resonant interaction of a rotating electron beam with the modes of a magnetron-type conducting boundary.

21.

PROPULSION AND FUELS

21B. Combustion and Ignition

536,948
AD-A153 448/6 Not available NTIS
Illinois Univ. at Urbana-Champaign.
Fronts and Patterns in Low Mach Number Combustion. A Review,
J. Buckmaster. 1984, 10p ARO-18243.28-MA
Contract DAAG29-81-K-0127
Availability: Pub. in Physica, v12D p173-181 1984 (No copies furnished by DTIC/NTIS).

Fronts or interfaces arise in a number of natural ways in combustion, and the mathematical limits that formally lead to these structures are discussed. Patterns arise if the fronts and the associated combustion field are unstable, and the most important mechanisms are described. Flames can be classified in a number of ways. This discussion will be restricted to low Mach number flames, thereby excluding the rich phenomena associated with detonation, a marriage of combustion with shock fronts. In addition only laminar combustion will be considered, although the concepts that will be introduced certainly have meaning for weakly turbulent flames. Thus we shall be concerned with low Mach number flames, of both the premixed and diffusion variety.

536,949
AD-A153 459/3 Not available NTIS
SRI International, Menlo Park, CA.
Spin-Orbit Splittings and Rotational Constants for Vibrationally Excited Levels of Isocyanate Energy Level Ten Square Two sub I.
R. A. Copeland, and D. R. Crosley. 1984, 16p ARO-21443.1-CH
Contract DAAG29-84-K-0092
Abstract in French.
Availability: Pub. in Canadian Jnl. of Physics, v62 n12 p1488-1501 1984 (No copies furnished by DTIC/NTIS).

Laser-induced fluorescence excitation spectra at 0.3/cm resolution has been obtained for the system of NCO present in an atmospheric pressure CH4-N2O flame. This combination of selectively detected laser fluorescence and a flame environment has permitted the high-resolution investigation of levels inaccessible in conventional room temperature experiments. Spin-orbit splitting, and rotational and vibrational constants have been determined for eight vibrational levels, primarily by fits to band-head positions using previously determined constants. The results are in good agreement with theoretical predictions of Renner-Teller interactions. Fermi resonance with an interaction strength of 10/cm describes variations in spin-orbit splittings and rotational constants for four levels quite well. Keywords include: Vibrational spectra, Spectroscopy, Fluorescence, and Excitation.

536,950
AD-A153 682/0/GAR PC **A10/MF A01**
Dayton Univ., OH. Research Inst.
Time-Averaged and Time-Dependent Computations of Isothermal Flowfields in a Centerbody Combustor.
Final rept. 15 un 82-15 Jun 84,
L. Krishnamurthy, M. S. Raju, M. J. Creed, and J. N. Memering. Dec 84, 203p UDR-TR-84-88, AFWAL-TR-84-2081
Contract F33615-82-K-2252

A numerical investigation of the near-wake region in a ducted bluff-body combustor by finite-difference computations is reported. The numerical prediction are based upon (a) the Reynolds-averaged Navier Stokes equations and the k-epsilon turbulence model; and (b) the time-dependent, compressible Navier-Stokes equations. The standard K-epsilon turbulence model was modified to account for the effect of streamline curvature and for the preferential influence of normal stresses. The time-averaged calculations addressed the turbulent mixing under isothermal conditions in (a) the large- and small-scale centerbody combustor configurations, due to annular air flow and central CO2 flow; and (b) the two-dimensional mixing-layer configuration, due to two streams of nitrogen at different velocities. The time-dependent calculations addressed the near-wake flowfield of the large-scale centerbody combustor configuration with only the annular air stream present. The Reynolds-averaged predictions examined the influence of the turbulence model corrections and geometric scale under varying annular and central flows on (a) the axial and radial distributions of the mean and fluctuating components of the axial and radial velocities and of the mean CO2 concentrations; and (b) the axial and the radial locations of the vortex center, as well as the magnitude and location of the minimum centerline mean axial velocity. Comparison of the predicted results with experimental data emphasizes and clarifies the complex flowfield interactions of the recirculating near-wake region.

536,951
AD-A153 693/7/GAR PC **A03/MF A01**
Army Ballistic Research Lab., Aberdeen Proving Ground, MD.
Investigation of Several Low-Lying Levels of X Doublet Pi State of NCO Using Argon Laser Excited Fluorescence.
Final technical rept.,
W. R. Anderson, A. J. Kotlar, J. A. Vanderhoff, and K. N. Wong. Dec 84, 31p BRL-TR-2625, SBI-AD-F300 592

The laser excited fluorescence spectrum of NCO from an atmospheric pressure CH4/N2O/N2 flame is reinvestigated with a more sensitive apparatus than used previously. The NCO is pumped from the X doublet pi (1,O,O) level to the A doublet sigma plus (O,O,O) level. Emissions from the excited A state level to the following X state vibrational levels are observed: doublet pi (O,O,O), (1,0,0), and (O,O,1); doublet sigma plus (O,1,O). The previous tentative assignment of pumping transition as Q2(31) is confirmed. The confirmation of pumping transition solidifies our earlier interpretation that excited state spin relaxation in the flame is much faster than electronic quenching. In addition, analysis of the fluorescence spectra yields the first reported constants for the X doublet pi (1,O,O) level and spin splitting for the X doublet pi (O,O,1) level in the gas phase.

536,952
AD-A153 830/5/GAR PC **A03/MF A01**
Illinois Univ. at Urbana-Champaign. Dept. of Mechanical and Industrial Engineering.
Research Test Facility for Evaporation and Combustion of Alternative Jet Fuels at High Air Temperatures.
Annual technical rept. 1 Feb 83-30 Jan 84,
J. E. Peters, H. Krier, K. K. Kim, R. E. Coverdill, and J. E. Kirwan. 1 Mar 84, 45p UILU-ENG-84-4001, AFOSR-TR-85-0383
Contract F49620-83-K-0027

Improved gas turbine combustion performance will require the effective utilization of alternative fuels and advanced combustor concepts. Further understanding of spray combustion processes including fuel evaporation and flame propagation is required. Research is underway which features a high pressure and temperature non-vititated air system to provide air at simulated gas turbine inlet conditions. A special fuel injection system was designed to produce monodisperse sprays for the purpose of evaporation and eventual combustion experiments in our newly developed test facility. This report represents a summary of the engineering activities during the first year (of a two year contract) which was focused on the construction of a combustion test facility in which the evaporation and burning rates of jet fuels can be measured as a function of inlet conditions and fuel properties. A large heat exchanger facility which supports this research can deliver continuously non-vitiated air at flowrates up to 1 kg/sec and 600 kPa at temperatures from 300 to 900K. Details of the evaporation/combustion test section are described. Also included are the design of the fuel injection system and test results of the injector showing monodisperse sprays with drop diameters of approx. 70 micrometers.

536,953
AD-A153 857/8/GAR PC **A04/MF A01**
Naval Research Lab., Washington, DC.
Chemical-Acoustic Interactions in Combustion Systems.
Memorandum rept.,
E. S. Oran, and J. H. Gardner. 24 Apr 85, 69p Rept no. NRL-MR-5554

A review is presented of chemical-acoustic coupling in terms of its role as a basic interaction which can alter the behavior of combustion systems. Effects resulting from this interaction include sound amplification, changes in sound speed and frequency, sound-induced changes in reaction rates, and acoustic stimulation of chemical oscillation and instabilities. Such effects are important in a variety of problems including combustion instability in jet and rocket engines, the structure of propagating detonations, and turbulence in chemically reacting flows. Background material is presented starting with the early work Lord Raleigh and continuing into a discussion of the relevant properties of sound waves. This leads to a discussion of the influence of energy release on sound waves and the influence of sound waves on chemical reactions. The conclusion is a discussion of chemical-acoustic coupling in combustion environments.

536,954
PB85-200210/GAR PC **A03/MF A01**
SRI International, Menlo Park, CA.
Laser Probes of Natural Gas Ignition Chemistry. Annual Report January-December 1984,
D. R. Crosley. Jan 85, 37p SRI-MP-85-024, GRI-85/0023
Contract GRI-5083-260-0896

The research described is aimed at developing laser induced fluorescence of various hydrocarbon species for use as probes in natural gas combustion chemistry. The radiative and collisional properties of CH were extensively studied. A two dimensional imaging experiment reveals much different CH and OH distributions in flames. Spectroscopic investigations on acetylene, formaldehyde, and methoxy were undertaken with some difficulty, and the latter tentatively identified in a flame. To identify observables with the chemistry, a model has been assembled with particular theoretical attention paid to radical-radical reactions such as methyl plus methyl. In addition, laser pyrolysis experiments have been used to follow portions of the high temperature chemistry in a time-resolved fashion to confirm ignition and flame mechanisms. Profiles of OH, CH, and C2 were obtained.

21D. Fuels

536,955
AD-A153 940/2/GAR PC **A03/MF A01**
Naval Research Lab., Washington, DC.
Distribution of Higher n-Alkanes in Partially Frozen Middle Distillate Fuels.
Final rept. Oct 82-Sep 84,
T. L. Van Winkle, W. A. Affens, E. J. Beal, R. N. Hazlett, and J. DeGuzman. 10 Apr 85, 39p Rept no. NRL-8869

In conjunction with continuing studies on the effect of composition on the freezing points of middle distillate fuels, attention was directed to partially frozen fuels. The crystals and residual liquid from partially frozen JP-5 and DFM fuel samples derived from both petroleum and shale were separated from each other and collected by means of the NRL liquid-solid separator apparatus (LSS) at several temperatures below the freezing points of the original samples. The original fuel samples, the solid material (precipitate), and liquid (filtrate) were characterized by gas chromatography (GC). The filtrate data were straightforward. As expected, Van't Hoff plot of the n-alkanes concentrations (log concentrations vs reciprocal absolute temperature) formed straight lines, and their slopes demonstrated the importance of the higher n-alkanes in fuel crystallization at cold temperatures. The precipitate data presented some problems of interpretation since it was observed that the waxy crystal precipitate matrix entrapped significant amounts of liquid (filtrate). The data on solid which were obtained by these methods demonstrated that the higher n-alkanes play the key role in

fuel crystallization at low temperatures, concentrating as much as tenfold in the crystallized solids compared to the liquid. Also, it was clearly shown that the n-alkanes form the major part, up to least 95% by weight in some fuels, of the solid crystals formed.

536,956
DE85003365/GAR PC A07/MF A01
Scientific Design Co., Inc., New York.
Great Plains ASPEN Model Development: Methanation Section. Final Topical Report.
S. S. Stern, and J. J. Kirman. Jan 85, 134p DOE/MC/19163-1778
Contract AC21-82MC19163
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted.

An ASPEN model has been developed of the Methanation Section, Section 1700, of the Great Plains Gasification Plant. The basis for this model is the process description given in section 6.12 of the Great Plains Project Management Plan and the Lummus Methanation Schematic Process Flow Diagram, Dwg. No. SK D-7102-IF-2. The ASPEN model that has been developed can handle the full list of process chemical components that are present in other sections of the plant; however, only the following components are assumed present in the section feed: hydrogen, nitrogen, ammonia, carbon dioxide, carbon monoxide, methane, and water. The model is primarily a flowsheet simulation which will give the material and energy balances and equipment duties for a given set of process conditions. The model is unable to predict fully changes in process conditions that would result from load changes on equipment of fixed sizes, such as a rating model would predict. The model can be used to simulate the steady-state operation of the plant at or near design conditions or can be used to design other methanation plants. The model also can be used in optimization studies of operating conditions. Because of the limited amount of process information that was available, several major process assumptions had to be made in the development of the flowsheet model. No catalyst specification, nor reactor size, nor kinetic data was available for the specific catalyst used at Great Plains. Among the most significant assumptions made were the outlet temperatures for the three stages of reaction and the approaches of the reactions to equilibrium. 47 references. (ERA citation 10:019690)

536,957
DE85006952/GAR PC A13/MF A01
Oregon State Univ., Corvallis.
Analysis of Drying Wood Waste Fuels with Boiler Exhaust Gases: Simulation, Performance, and Economics.
R. W. Kirk, and J. B. Wilson. Sep 84, 300p DOE/ET/11286-29
Contract AT06-76ET11286
Portions of this document are illegible in microfiche products.

This study evaluates the feasibility of retrofitting a rotary dryer to a hog fuel boiler, using the boiler exhaust gases as the drying medium. Two simulation models were developed. Each model accurately predicts system performance given site-specific parameters such as boiler steam demand, fue moisture content, boiler exhaust temperature and combustion excess air. Three rotary dryers/hog fuel boilers currently in operation in the forest products industry were analyzed. The data obtained were used to validate te accuracy of the simulation models and to establish the performance of boiler/dryer systems under field conditions. The boiler exhaust temperatures observed ranged from 340 to 500 exp 0 F and indicated that significant drying could be realized at moderate stack temperatures, as substantitated by experimental moisture content data. The simulation models were used to evaluate a general boiler/dryer system's sensitivity to variation in operating conditions. The sensitivity analyses indicated that under moderate conditions (400 exp 0 F boiler exhaust, etc.) the installation of a rotary dryer results in a 15% increase in boiler efficiency and a 13% decrease in fuel consumption. Both the field data and sensitivity analyses indicated that a greater increase in boiler efficiency could be realized at higher stack temperatures, approximately a 30% increase in boiler efficiency for a stack temperature of 600 exp 0 F. The cash flow basis payback periods based on hog fuel savings due to dryer installation ranged from 2.7 years for a used dryer to 3.9 years for a new dryer. The payback periods for equivalent BTU savings of gas and oil ranged from 1.2 to 2.0 for gas and from 1.3 to 2.1 years for oil. This study concludes that retrofitting a rotary dryer to an existing hog fuel boiler is an economically feasible option to the forest products industry. 31 references, 24 figures, 18 tables. (ERA citation 10:022500)

536,958
DE85007880/GAR PC A02/MF A01
Brown Univ., Providence, RI. Div. of Engineering.
Active Sites in Char Gasification. Fourth Quarterly Progress Report, July-September, 1984.
E. M. Suuberg, J. M. Calo, M. Wojtowicz, and W. Lilly. 1984, 8p DOE/PC/60800-T3
Contract FG22-83PC60800

The subject of this research is the origin, nature, and fate of active sites in chars derived from parent hydrocarbons with coal-like structure. The highly crosslinked, phenol-formaldehyde resins described in detail in the third quarterly report are again the subject of this report. Details of the curing process were given in that report and are employed here, except that the final stage of curing involves two hours at 300 exp 0 C rather than at 400 exp 0 C as previously used. It is important to emphasize that the curing methodology employed in this study (in which there is a long period of low temperature heat soak) apparently crosslinks the resin to the extent that there is no development of the glassy carbon texture obtained by pyrolyzing raw resin immediately at higher temperatures. This fact should be kept in mind when examining the surface areas of the chars, which are considerably in excess of those seen with the more glassy chars reported by some workers. Measurements performed on the resin reported here involve: oxygen chemisorption, as a function of pyrolysis conditions and chemisorption conditions; total surface areas, by N sub 2 adsorption; and gas desorption. 6 references, 1 table. (ERA citation 10:022290)

536,959
DE85008132/GAR PC A03/MF A01
Cities Service Research and Development Co., Tulsa, OK.
Advanced Research for the Characterization of Hydrogen Donor Solvents in Two-Stage Liquefaction. Quarterly Report, October 1-December 31, 1984.
R. S. Chillingworth, and J. D. Potts. 1985, 50p DOE/PC/60047-T6
Contract AC22-83PC60047
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The purpose of this research program is to develop an improved method for producing a highly effective solvent for the Integrated Two-Stage Liquefaction (ITSL) process and to study the characteristics of the solvent at a variety of process conditions. The ITSL process for conversion of coal to distillate liquids combines Short Contact Time (SCT) hydroliquefaction and expanded bed hydrogenation and hydrocracking of the coal extract, either before or after deashing. Experimental microautoclave work in Subtask 2.3 (solvent hydrocracking with catalysts) was completed. A total of fourteen catalysts were tested from which six were chosen for further evaluation in Subtask 3.2. The six catalysts are: Shell 324 Mod. Ni/Mo; Shell 317 Ni/Mo; American Cyanamid Beaded Co/Mo; Katalco NM-506 Ni/Mo; American Cyanamid 1442B Co/Mo; and Procatalyse HT-841 Ni/Mo. Scheduled microautoclave work in Subtask 3.2 (coal extract and solvent hydrogenation) was completed. Initial results show that the quality of the hydrogenated product, based on hydrogen content, depends primarily on the hydrogen content of the SCT paste solvent which made the extract feedstock to Subtask 3.2. The choice of catalyst in the hydrotreater and the severity of the SCT extract production step were of lesser significance to the quality of the hydrogenated product. The catalytic reactor conditions also are of great importance in product quality and may be used to adjust the hydrogen content of an insufficiently hydrogenated or overly hydrogenated recycle paste solvent stream. 2 figures, 10 tables. (ERA citation 10:022289)

536,960
DE85008376/GAR MF A01
North Central Forest Experiment Station, St. Paul, MN.
Economic Analysis of Three Methods to Dry Biomass Fuels. Final Report, Biomass Fuel Drying Project.
E. Pepke. Oct 84, 125p DOE/OR/21390-T6
Contract FG05-83OR21390
Microfiche only, copy does not permit paper copy reproduction.

Three methods of drying biomass fuels were evaluated to determine the relative economic advantages of each method. The first to be investigated was a traditional, single-pass, rotary drum dryer. Secondly, a pressure steam drying process was examined and compared to the rotary drum dryer. Lastly, a corncob dryer developed to reduce the moisture of this fuel to dry corn was evaluated. All of the systems evaluated have positive and relatively higher benefit cost ratios. Although the corncob system had the highest benefit cost ratio, it is also the system with the most hypothetical assumptions. Experimentation with some of the input parameters, such as the temperature of the flue gas discussed previously, showed that the corncob dryer and combustion unit had the least stability of the four alternatives. Results of these economic analyses confirm Frea's findings on the relative disadvantage of a rotary drum drying system compared to not predrying fuel before the boiler. Frea states that a rotary drum dryer heated by flue gas energy was not economically favorable for 50% m.c. wood chips. The pressure steam dryer would have a more positive economic picture if the low pressure steam which is generated by the system had a value to the plant. The scenario for this economic analysis report precluded valuation of the steam byproduct because all systems had to be comparable; the other systems did not produce excess steam. The four systems simulated for this report show positive benefit cost ratios even under our conservative economic parameters and would provide a favorable investment under the right circumstances. Each individual installation will differ in its operating characteristics and energy requirements. Therefore, comprehensive feasibility studies must be performed at each facility to determine the most economically advantageous system. One of the appendices contains a literature review on drying biomass fuels. 75 references, 7 figures, 7 tables. (ERA citation 10:020169)

536,961
DE85008502/GAR PC A02/MF A01
California Univ., Berkeley. Coll. of Engineering.
Characterization of Coal Surfaces. Technical Progress Report, November 21, 1984-February 20, 1985.
D. W. Fuerstenau. Mar 85, 16p DOE/PC/70776-T2
Contract FG22-84PC70776

The broad objective of this research program is to conduct a systematic investigation of the surface properties of coal and to relate them to coal utilization. Initial work is involved with quantification of oxygen functional groups on the surface of coal. Specifically, this report summarizes proximate and ultimate analysis of various available coals, as well as a partial review of oxygen functional group analysis techniques. Results using these analysis techniques, specifically the potentiometric titration of carboxyl and phenolic oxygen functional groups, are presented in conjunction with a new approach to assess coal wettability. This approach uses a film flotation cell developed for assessing coal producing lyophobicity-lyophilicity. Results of coal surface characterization using this technique are available for graphite, as well as for several Western and Eastern bituminous coals. 15 references, 9 figures, 2 tables. (ERA citation 10:022310)

536,962
DE85008517/GAR PC A02/MF A01
Battelle Pacific Northwest Labs., Richland, WA.
Thermochemical Gasification of High-Moisture Biomass Feedstocks.
R. S. Butner, L. J. Sealock, and D. C. Elliott. 14 Feb 85, 9p PNL-SA-12938, CONF-850240-3
Contract AC06-76RL01830
Alternative energy in the Midwest: research and applications, Schaumburg, IL, USA, 21 Feb 1985.

A significant energy resource base exists in the Midwest in the form of crop residues and wastes. Estimates have been made that this resource is on the magnitude of 1.5 Quads (1 Quad = 10 exp 15 Btu's). One obstacle to the full utilization of this resource is the high moisture content of many crop residues. A DOE-funded research program being conducted by Pacific Northwest Laboratory is investigating a low-

temperature, mixed catalyst thermochemical system which efficiently converts high-moisture biomass to a medium Btu gas consisting of methane and hydrogen. Experimental data indicates that carbon conversions in excess of 90% may be obtained. Feedstock slurries containing up to 95% moisture have been used successfully in the batch reactor. Feedstocks used in the system include sorghum, sunflowers, napier grass, aquatic plants and food processing wastes. The ability to convert high-moisture biomass to fuels via this thermochemical process may allow greater utilization of the significant biomass resource base which exists in the Mdwest. 6 references, 6 figures, 2 tables. (ERA citation 10:022489)

536,963
DE85008983/GAR PC **A02/MF A01**
Wells (Clifford E.), Buchanan, VA.
Utilization of Low Grade Coal. Final Report.
C. E. Wells. 1 Dec 81, 17p DOE/R3/02444-T1
Contract FG43-80R302444

Purpose was to construct and use a pilot furnace that could utilize low-grade coal (steam coal and coal fines) in place of oil or natural gas. This pilot furnace was tested on a 66-inch Raymond H.S. Roller Mill at the No. 1 plant of the James River Limestone Co. Results indicate that the commercial use is feasible; drying costs average $0.36 per ton with coal vs $0.80 per ton on annual basis when oil fired. Results are applicable to limestone manufacturers producing dry pulverized products. (ERA citation 10:022807)

536,964
DE85008991/GAR PC **A03/MF A01**
Pigott (Miles Thomas), State College, PA.
Nearly Free and Sustained Fuel for a Rural Home Owner's Wood Burner. Final Report.
M. T. Pigott. 30 Sep 82, 39p DOE/R3/02421-T1
Contract FG43-80R302421
Portions of this document are illegible in microfiche products.

To plant one's own firewood on a continuing cyclic basis, I make the following recommendations: (1) First decide whether there is more land, less time or more time, less land. For more land, less time, choose a less crowded spacing. (2) Prepare the land by clearing, soil testing, fertilizing, and mulching with 4 mil 10' x 25' sheets of black plastic. Anchor the plastic by burying the edges with a 20% duty cycle. Mulching will make it unnecessary to mow weeds. (3) Hand dig the holes for the trees, cutting through the prelaid plastic. (4) Spray trees against gypsy moths and Japanese Beetles. The effects of crowding are summarized as follows: there is a 5% gain in growth rate but an 8% loss in ratio of diameter to height. The product of the two yields a 3% loss for each of the crowded trees relative to the selected uncrowded trees. This slight loss per tree, however, is over-shadowed by the gain of 25/9 (278%) afforded by the use of less space. Insofar as extrapolating is permissable, crowding yields a 275% increase in wood/acre. The costs are disappointingly high. Unless the resident has some capital equipment already, he would certainly be tempted to buy his firewood by the cord from some supplier. However, the philosophy underlying the principal motive for such a project is that sources now available will be exhausted if many more residents install wood burning stoves. Growing your own firewood than insures a source. (ERA citation 10:022501)

536,965
DE85009400/GAR PC **A02/MF A01**
Kriley Solar Distributors, Harrisville, PA.
Solar Produced Alcohol for the Small Farm. Final Technical Report.
D. B. Kriley. 1985, 17p DOE/R3/06084-T1
Contract FG43-79R306084
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Results obtained during the operation of a small-scale ethanol plant on a farm are reported. It is shown that: (1) ethanol can be produced from corn without the use of expensive commercial enzymes and expensive heating systems; (2) ethanol can be produced the small farm with temperatures under 130 exp 0 F through the entire process. (Solar energy is definitely usable in these temperature ranges); (3) locally obtained equipment can be used to build a low temperature distillation system (for example, stainless bulk milk tanks, surplus glass, aluminum roofing, etc.); (4) cost per gallon of ethanol is greatly reduced by producing ethanol on farm; and (5) energy consumed to produced ethanol is reduced by as much 30,000 Btu's in the distillation process. The best commercial fossil fuel systems use at least 20,000 Btu in distillation. This alone represents about half of the Btu's normally used in alcohol production. The author recommends that the model farm ethanol plant should use the following equipment: (1) solar heat (ethanol fired backup); (2) continuous fermenter (use less fermentation tanks); and (3) vacuum still (uses low temperature; can utilize stored solar heat more effectively). (ERA citation 10:022494)

536,966
DE85009475/GAR PC **A14/MF A01**
Burns and Roe Services Corp., Pittsburgh, PA.
Summary of AR and TD/APT Contracts and Grants Supported by the Office of Fossil Energy FY 1984.
1984, 317p DOE/NBM-5009475
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This book is a compilation of summaries of research contracts and grants supported by the Office of Fossil Energy in FY84 under the following two programs: Advanced Research and Technology Development (AR and TD), and Advanced Process Technology (APT). The summaries consist of one-page fact sheets for each contract or grant providing business information, research objectives, statement of work and major accomplishments. (ERA citation 10:022273)

536,967
DE85009535/GAR PC **A03/MF A01**
Solar Turbines, Inc., San Diego, CA.
Mechanisms of Fouling, Slagging and Corrosion by Pulverized Coal Combustion. Quarterly Technical Progress Report No. 3, April 1-June 30, 1982.
L. L. Hsu, A. R. Stetson, and A. G. Metcalfe. Jul 82, 39p DOE/PC/40272-T7
Contract AC22-81PC40272
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The objective of this program is to conduct a detailed and comprehensive study of the mechanisms of fouling, slagging and corrosion in pulverized coal combustion by employing well-controlled model systems which simulate the coal combustion environment. Calibration of the combustor rig is completed with all tubes operating at target temperature. Details of calibration procedures are provided in the report. Initial testing of NC-430, Hastelloy X, Croloy and SA210 tubes in sulfur-free, combustion effluent gases containing NaCl and Al sub 2 O sub 3 particles indicated insignificant sintering or adherence of the particles to the tube surface. (ERA citation 10:019850)

536,968
DE85009539/GAR PC **A05/MF A01**
Santa Clara Univ., CA. Dept. of Mechanical Engineering.
Impact of Alcohol Fuels on Urban Air Pollution: Methanol Photochemistry Study. Final Report.
R. K. Pefley, B. Pullman, and G. Whitten. Nov 84, 81p DOE/CE/50036-1
Contract FG03-84CE50036
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Experimental evidence has been obtained to support methanol's low photochemical reactivity when substituted for typical urban hydrocarbons. This evidence supports a previous urban modeling study in which significant ozone reductions were predicted with large scale methanol substitution for gasoline. An improved (urban hydrocarbon) chemical kinetic mechanism has also been partially validated along with methanol's photochemistry. 15 references, 28 figures, 7 tables. (ERA citation 10:022490)

536,969
DE85009726/GAR PC **A02/MF A01**
Southern Illinois Univ. at Carbondale.
Regulation of Alcohol Fermentation by Escherichia Coli. Progress Report.
D. P. Clark. 1985, 5p DOE/ER/12095-1
Contract AC02-82ER12095

Constitutive adhC mutants were used as a starting point for the isolation of further mutants, some of which are defective in alcohol dehydrogenase (ADH) and/or acetaldehyde dehydrogenase (ACDH) activities and some of which are regulatory and express elevated enzyme levels. The structural mutants map close to the adhC gene, suggesting the existence of an anaerobically controlled operon responsible for the conversion of acetyl-CoA to ethanol. Purification of the two enzyme activities indicates that both copurify as a complex of approximately 200,000 daltons. Although confirmation is required, both enzyme activities appear to be functions of a single polypeptide of MW 100,000 daltons. This interpretation is consistent with genetic data which show that most mutants selected directly for loss of either enzyme have also lost the other activity. Temperature sensitive mutants in which both enzymes are thermolabile also support the idea of a single polypeptide for the two activities. Regulatory mutants located away from the adhC locus have been isolated, and result in two to tenfold elevation of both ADH and ACDH. These mutants are in process of further characterization. Study of adh regulation by means of gene fusions has been slowed by technical problems, however we have devised a direct method for the selection of mutants unable to excrete acidic fermentation products and have accumulated a variety of anaerobically regulated gene fusions which have allowed us to estimate that anaerobiosis in E. coli requires the induction of around 50 genes. (ERA citation 10:023135)

536,970
DE85009757/GAR PC **A14/MF A01**
Brookhaven National Lab., Upton, NY.
Model Documentation of the Gas Analysis Modeling System. Volume 3. Software and Data Documentation and User's Guide.
A. S. Kydes. Aug 84, 301p BNL-35957-V.3
Contract AC02-76CH00016
Portions of this document are illegible in microfiche products.

This is Volume 3 of three volumes of documentation for the Gas Analysis Modeling System (GAMS) developed by the Analysis and Forecasting Branch, Reserves and Natural Gas Division, Office of Oil and Gas, Energy Information Administration (EIA), US Department of Energy. The documentation has been developed to comply with the requirements specified in Energy Information Administration Order EI 5910.3A, Guidelines and Procedures for Model and Analysis Documentation, effective Otober 1, 1982. Volume 3 is intended to satisfy (along with the model archive tape) the requirements of paragraph 5.c(2), 5.c(4) and 5.c(5) of the Order. The archive tape is denoted by the acronym GAMS83 and contains the version of GAMS used for the 1983 Annual Energy Outlook. Volume 3 describes this version of the software in detail. (ERA citation 10:022743)

536,971
DE85010171/GAR PC **A02/MF A01**
Eyrich (Frederick H.), Oley, PA.
Solar Energy Assisted Alcohol Fuel System for Farm.
F. H. Eyrich. 1 Feb 84, 8p DOE/R3/06263-T1
Contract FG43-80R306263
Portions of this document are illegible in microfiche products.

A project is briefly described which would produce ethanol on a farm using LP gas as a heat source and heat recovered from the fermenter to preheat water. (ERA citation 10:022496)

536,972
DE85700309/GAR PC **A10/MF A01**
Centro de Desenvolvimento da Tecnologia Nuclear, Belo Horizonte (Brazil).
Atomic Absorption Spectrophotometry for the Determination of Metallic Impurities in Coal.
Tese (M.Sc.),
M. J. S. F. da Silva. Jun 83, 214p NUCLEBRAS-CDTN-455/83
In Portuguese.
U.S. Sales Only.

The Brazilian Energetic Alternative Program expects the reduction of our dependence on foreign energy sources, through replacing fuel oil by mineral coal. Its gasification by means of nuclear energy must be also considered. However, the intensive burning of coal leads to serious environmental problems. During its combustion the release, to atmosphere, of toxic elements such as As, Hg, Pb, Sb, Se, Cd, Zn and others is of great concern. Increase in atmospheric pollution will take place by burning increased amounts of coal. In

addition, some of those elements are concentrated in fly ashes. The determination of impurities in coal is also important for the Figueiras Project in the Nuclebras Mineral Prospection Program. Hence, it is important to have reliable analytical methods which can monitor inorganic constituents at various stages of coal production and utilization. The atomic absorption spectrophotometry is a suitable analytical technique to determine pollutants in coal because it is sensitive, simple, economic and covers a large range of concentrations. The need of a previous treatment of the sample is overcome by using an acid attack (HNO sub 3 + HClO sub 4 + HF) which has proved to be rapid and efficient. (Atomindex citation 15:071733)

536,973

DE85901258/GAR PC A09/MF A01
Institute for Industrial Research and Standards, Dublin (Ireland). Information Technology Group.
Retrospective Search on Direct Combustion of Charcoal, Wood Pellets, Wood and Other Solid Biomass Fuels Including Basic Combustion Research.
Sep 83, 188p NP-5901258
U.S. Sales Only.

This literature survey covers the period 1976 to date and relates to the direct combustion of solid biomass fuels. The biomass feedstocks covered include agricultural wastes, forestry and wood wastes, and municipal solid wastes. A section on wood burning equipment is included. (ERA citation 10:020176)

536,974

PB85-187516/GAR PC E03/MF E03
Technische Univ., Vienna (Austria).
Joint Production of Substitutable, Exhaustible Resources or: Is Flaring Gas Optimal,
F. Wirl. 1983, 12p

Despite the large recent interest in exhaustible resources some 'real world' problems have not been investigated yet. This paper tries to explain the phenomena of wasting resources departing from the example of oil and (associated) gas production. In particular, if a joint production process is considered for two exhaustible resources, which are imperfect substitutes, then it may be optimal to 'flare' one of the resources at least in monopolistic markets. Hence the puzzle of flaring natural gas can be solved by an economic argument.

536,975

PB85-192185/GAR PC A08/MF A01
Massachusetts Inst. of Tech., Cambridge. Technology Adaptation Program.
Energy Policy Project: Petroleum and Natural Gas in Egypt.
Final rept.,
N. Choucri, and M. Z. Shafei. Jun 83, 170p TAP-83-11, AID-PN-AAN-766
Prepared in cooperation with Cairo Univ., Giza (Egypt).

Egypt's Energy Policy Project was designed to provide a comprehensive view of the roles of petroleum and natural gas in the Egyptian economy. The major elements and conclusions of research conducted under the project are summarized herein. Part I provides background information on the supply of and demand for petroleum and natural gas in Egypt and on recent changes in the structure of the Egyptian economy. In Part II, uses of energy in Egypt are detailed in terms of industrial uses and overall macroeconomic flows; policy issues are briefly addressed. Egyptian petroleum resources are examined in Part III, which presents the results of geological surveys of four petroliferous provinces as well as forecasts from a dynamic simulation model of the Egyptian petroleum industry; the model incorporates supply, demand, finance, and policy variables and can be disaggregated by region or actor (oil companies or the Government). In Part IV the best uses of natural gas in Egypt and the prices that should be charged for these uses are identified, while Part V presents a macroeconomic analysis of the likely effects of a rise in domestic petroleum prices. Finally, specific analyses yet to be undertaken are outlined.

536,976

PB85-192268/GAR PC A05/MF A01
Rice Engineering Design and Development Inst., Houston, TX.
Brine Chemistry and Control of Adverse Chemical Reactions with Natural Gas Production. Annual Report January - December 1984,
J. M. Matty, G. G. Waggett, K. Varughese, J. Greenberg, and M. B. Tomson. Jan 85, 89p GRI-85/0047
Contract GRI-5084-212-0890

Monitoring brine chemistry to determine the extent of potential adverse reactions has been simplified by the development of a field brine test kit and a series of nomographs. Results of the kit analyses serve as input to the nomographs, which provide a graphic means of determining the scaling tendency (Saturation Index value) of a brine. Brines that do not tend to form scale may be corrosive. Saturation Index values have been correlated with various processes using data from geopressured wells in the Gulf Coast area. Control of scale in surface equipment of geopressured wells by chemical inhibitors has been successful. Downhole treatment with inhibitors to prevent scale formation in the production tubing is being investigated. Laboratory simulations indicate that an inhibitor squeeze treatment may be successful at the Gladys McCall No. 1 well. Inhibitor mixtures exhibit additive behavior at minimum concentration levels; however, behavior at maximum concentration may depend on the type of inhibitor used. It is possible that inhibitor mixtures could be used to extend the upper limit of inhibitor effectiveness. Control of corrosion by a coating of ferrous carbonate is being investigated in the laboratory. Electrochemical corrosion studies are planned for the future.

536,977

PB85-199594/GAR PC A06/MF A01
Institute of Gas Technology, Chicago, IL.
Measurement and Analysis of Two-Phase Flow through Low Permeability Media. Volume 1. Task 1. Theoretical Research.
Annual rept. 16 Nov 83-15 Nov 84,
H. Arastoopour, M. Newberg, and J. Semrau. Jan 85, 107p GRI-85/0018
Contract GRI-5082-260-0711
See also PB84-174465.

The effect of system parameters on the transient gas flow rate and pressure distribution for flow of gas in low permeability tight sand core samples were studied using the authors computer programs. The behavior of theoretical flow rate for oscillatory temperature variation at both ends of core samples resembles that of experimentally observed flow rates. A model for porosity determination was developed to account for pore neck blockage resulting in pockets of trapped gas in partially saturated low permeability tight sand cores with small pore diameters. A computer code based on one dimensional, mass and momentum equations in the cylindrical coordinate was developed, to calculate gas production and pressure distribution in an ideal tight sand reservoir with a producing well at the center. For two phase flow of gas and liquid through low permeability porous media, a computer program was developed based on one dimensional continuity and modified Darcy's equation for each phase. In addition, to investigate the potential and applicability of the multiphase flow models in flow of gas in low permeability porous media, computer codes were developed based on different momentum balances.

536,978

PB85-199628/GAR PC A07/MF A01
Radian Corp., Austin, TX.
Process Description of the Great Plains Gasification Project.
Topical rept.,
F. D. Skinner, and N. P. Meserole. Mar 85, 133p GRI-85/0049
Contract GRI-5083-253-0936

The Great Plains Gasification Associates (GPGA) facility is the only operating plant in the world designed for commercial scale production of substitute natural gas. The GPGA plant is intended to demonstrate that a clean high-Btu gas can be economically produced in a manner which does not adversely affect the environment, the health and safety of the workers or the general public. As the plant is in start-up actual data and final system configuration may not be available for some time. This document gives the currently available information and data on the GPGA plant with emphasis on environmental and health aspects. The presentation, which is the first in a series of documents, is arranged for ease of comparison of the plant configurations of and EH&S data from other coal gasification plants which have been or are being studied.

536,979

PB85-204600/GAR PC A05/MF A01
Texas Univ. at Austin. Dept. of Chemistry.
Vectorial Electron Transfer on Designed Surfaces. Annual report January 1984 - January 1985,
A. J. Bard, A. Campion, M. A. Fox, S. E. Webber, and J. M. White. 15 Mar 85, 94p GRI-85/0053
Contract GRI-5082-260-0756
See also PB84-198530.

Several systems have been investigated for photochemical-water systems and the chemical and physical factors that govern their efficiencies have been studied. For platinized CdS particles immobilized in a polymer (Nafion) matrix the induction period for H2 formation has been shown to correlate with the extent of reduction of the initiallY partially oxided Pt catalyst. The crystalline form of the CdS can be controlled by the precipitation conditions. Cubic CdS, which is more active for H2 generation, has a much rougher surface that is rich in sulfate. On the other hand, hexagonal CdS has a much smoother surface, which is covered by sulfide. A novel mixed semiconductor system ZnS:CdS was discovered, which is nearly as active as the platinized CdS system. This is the first example of efficient photocatalysis for this reaction that does not require a noble metal to catalyze H2 evolution. The performance of the ZnS:CdS system is shown to be essentially indifferent to the nature of the support which has been silica, alumina or nylon mesh as well as the original Nafion.

536,980

PB85-204618/GAR PC A04/MF A01
Battelle Pacific Northwest Labs., Richland, WA.
Electron Transfer and Ion Pair Formation during Oxidation and Gasification of Coal. Final Report February 1982 - February 1985,
D. M. Camaioni. Apr 85, 74p GRI-85/0056
Contract GRI-5081-260-0536
See also PB84-198555.

This report describes a research project directed towards investigating the possible or potential role of radical cations and hydroxyl adduct radicals in coal gasification. Basic knowledge relating to the reactions of radical cations and hydroxyl adducts of coal related compounds was deduced from study of Cu(II)-catalyzed peroxydisulfate oxidations conducted in aqueous acetonitrile. Bibenzylic and related compounds, aromatic aldehydes, and alkyl- and acyl-anthracenes were observed to undergo facile side chain fragmentation and ring oxidation reactions. Preferred reaction pathways were structure and medium dependent. Hydration of radical cations to form hydroxyl adduct radicals readily occurred but acid suppressed the reaction for monocyclic alkylaromatic radical cations in favor of side chain fragmentation. Loss of benzylic protons was usually favored but cleavage of bibenzylic C-C bonds occurred when sufficiently more stable radical and cationic fragments could be formed. Thus, the radical cations of 1,2-diarylethanes reacted by proton loss but those of 1,2-diarylethanol and 2,3-diphenyl-2,3-dimethylbutane reacted by C-C cleavage. The hydration reactions of 9-alkyl- and 9-acyl- anthracene radical cations to form hydroxyl adduct radicals were not suppressed by acid and direct side fragmentation was not observed. The implication of these and other results to coal gasification is discussed.

21E. Jet and Gas Turbine Engines

536,981

AD-A153 753/9/GAR PC A03/MF A01
Universal Energy Systems, Inc., Dayton, OH.
Multi-Ducted Inlet Combustor Research and Development.
Final rept. 31 Aug 81-31 Aug 84,
G. D. Streby. Mar 85, 26p AFWAL-TR-85-2004
Contracts F33615-81-C-2074, SB5448-81-C-0518

Hydrodynamic simulations were conducted of dual inlet side dump combustor configurations to obtain flow visualization and residence time data using the Water Tunnel test rig facility of the Ramjet Technology Branch AFWAL/PORT Wright-Patterson AFB, Ohio. Tests were conducted for inlet duct angles of 30, 45, and 60 degrees for variations in the combustor dome plate height from 0.0 to 6.0 inches, for total combustor

fluid flow rates of 200, 300 and 400 gallons per minute, for nozzle area to combustor area ratios of 0.20, 0.29 and 0.39, and for combustor lengths of 20.13, 39.0 and 53.25 inches. The inlet duct Reynolds Numbers for each total flow rate tested were 125,640 for 200 gallons per minute, 188,400 for 300 gallons per minute, and 251,300 for 400 gallons per minute. Also reported on are specialized research efforts concluded to support advanced combustor studies.

536,982
AD-A153 767/9/GAR PC **A06**/MF **A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
Improved Statistical Analysis Method for Prediction of Maximum Inlet Distortion.
Final rept. 1 Jan 83-31 Mar 84,
D. Sedlock. Mar 85, 116p Rept no. AFWAL-TR-84-3085

This report presents the results of an investigation to develop an analytical method which predicts the maximum pressure distortion level and provides a synthesized pressure distortion map at the entrance to the turbine engine compression system. The method uses inlet total pressure statistical properties and a random number process to predict the most probable maximum pressure distortion and pressure distortion map. The validity of the method is demonstrated by comparing predicted maximum distortion levels and pressure contour maps with measured peak distortion levels and pressure contour maps obtained from analog screening of inlet pressure data.

536,983
AD-A153 811/5/GAR PC **A04**/MF **A01**
Tennessee Univ. Space Inst., Tullahoma.
Compressor and Turbine Models - Numerical Stability and Other Aspects.
Final rept. 1 May 82-1 May 84,
K. C. Reddy, and S. N. Nayani. Apr 85, 70p AEDC-TR-85-5
Contract F40600-82-C-0003

This report deals with the mathematical-numerical models used at AEDC for the simulation of aircraft engine compressors and turbines. Numerical stability problems encountered in a one-dimensional compressor model (COMP2SP) have been eliminated with appropriate changes in the algorithm. A multi-dimensional finite volume code (ATAC), which simulates the operation of a turbine, has been analyzed, and the source of numerical oscillations in that code has been isolated. Subsequently, proper changes to the ATAC code have been made at AEDC and numerical oscillations have been eliminated. Stage characteristics based on the total pressure loss coefficient and the deviation angle as functions of incidence angle have been found to be less sensitive to errors in interpolation for intermediate speeds than the pressure and temperature co-efficients as functions of the flow coefficient. Multi-dimensional compressor model equations suitable for simulating the circumferentially distorted flows have been developed. Characteristics and compatibility equations are derived for the imposition of inflow and outflow boundary condition.

536,984
AD-A153 911/3/GAR PC **A13**/MF **A01**
Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
Compressor Research Facility F100 High Pressure Compressor Inlet Total Pressure and Swirl Profile Simulation.
Final rept. Dec 80-Nov 83,
W. W. Copenhaver. Oct 84, 285p Rept no. AFWAL-TR-84-2030

The F100 gas turbine engine currently powers the F-15 and F-16 aircraft. The compression section of this engine consists of a three-stage fan followed by a ten-stage High Pressure Compressor (HPC). A component test of the F100 HPC will be performed in the Compressor Research Facility (CRF) of the Aero Propulsion Lab (APL) at Wright-Patterson AFB, to investigate its stall and post stall characteristics. This testing will require that the high pressure compressor entrance profiles be simulated to obtain results which correspond to actial engine operation. Since these entrance profiles had never been measured, a program was designed to experimentally measure the total and static pressure, temperature and flow angle profiles at the HPC entrance of an F100 Series 3 engine (F100(3)). Data acquisition methods and results of a test to obtain the engine profieles are detailed. The design and testing efforts to simulate these profiles through preswirl vanes and screens are also defined. The CRF F100 inlet hardware configuration detailed in this report are also defined. The CRF F100 inlet hardware configuration detailed in this report provides adequate engine inlet profile simulations to assure that comparisons can be made between CRF F100 test results and the engine environment.

536,985
AD-A153 977/4/GAR PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Combustion Research for Gas Turbine Engines.
Technical memo.,
E. J. Mularz, and R. W. Claus. 1985, 19p NASA-E2490, NASA-TM-86983, USAAVSCOM-TR-85-C-2

Research on combustion is being conducted at NASA's Lewis Research Center to provide improved analytical models of the complex flow and chemical reaction processes which occur in the combustor of gas turbine engines and other aeropropulsion systems. The objective is to obtain a better understanding of the various physical processes that occur in the gas turbine combustor in order to develop models and numerical codes which can accurately describe these processes. Activities include in-house research projects, university grants, and industry contracts and are classified under the subject areas of advanced numerics, fuel sprays, fluid mixing, and radiation-chemistry. Results are highlighted from several projects.

536,986
PATENT-4 503 668 Not available NTIS
Department of the Air Force, Washington, DC.
Strutless Diffuser for Gas Turbine Engine.
Patent,
G. H. Duncan, and D. L. Cooper. Filed 12 Apr 83, patented 12 Mar 85, 5p AD-D011 662/4, PAT-APPL-6-484 390
Supersedes PAT-APPL-6-484 390, AD-D010 244.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $1.00.

This patent discloses an improved diffuser for a gas turbine engine which is mounted between a compressor section and a burner section. The diffuser eliminates struts by using the exit guide vanes of the compressor for support. The vanes are fixedly mounted to an inner case wall and to a double outer wall. A cantilevered case wall being one of the double outer walls can flex both radially and axially to relieve thermal stress in the vanes. Additionally, probes can be mounted in access ports formed in the double outer wall. Compressor leakage gas is prevented from entering voids in the double outer wall by a seal seated between the cantilevered case wall and the other case wall.

536,987
PB85-189959/GAR PC **E05**/MF **E05**
Commission of the European Communities, Luxembourg.
Operation of Gas Turbines on Liquid Hydrogen.
Final rept.,
F. A. Hewitt. c1984, 89p EUR-8691-EN
Portions of this document are not fully legible.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The aim of this project was to determine the feasibility of operating gas turbines on liquid hydrogen fuel. Project work commenced in several areas which showed promise for achieving the optimum use of the hydrogen properties. These included analysis of suitable burner and combustion chamber designs, heat exchange systems to allow cooling of turbine cooling air and recuperation of exhaust heat into the fuel, and the suitability of current air-cooled turbine components for use with cooled cooling air supplies. A computer program was developed to calculate accurately the performance of engines with complex heat exchange arrangements, fuelled with cryogenic fuels. The data obtained were used to optimize the use of hydrogen fuel in two engines of current design, and to evaluate the performance of these and other engine cycles using hydrogen. The design rules for control systems for such engines were outlined, and the requirements for hardware development were defined.

536,988
PB85-861821/GAR PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gas Turbine Fuel Controls. 1970-June 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-Jun 85.
Jun 85, 137p

This bibliography contains citations of selected patents concerning fuel control devices, and methods used to regulate gas turbine engine speed and load. The utilization of hydromechanical, electromechanical, and electronic devices related to engine dynamics, combustor temperature, and compressor pressure is discussed. Fuel control systems for gas turbine power plants and aircraft gas turbines are presented. (Contains 187 citations fully indexed and including a title list.)

21F. Nuclear Propulsion

536,989
DE85750276/GAR PC **A09**/MF **A01**
Hanover Univ. (Germany, F.R.). Fakultaet fuer Maschinenwesen.
Energy-Supply-Independent after-Heat Removal in Nuclear Propulsion Plants for Ships in Combination with Sinking and Cantering.
Diss,
G. Finke. 1984, 188p GKSS-84/E/22
In German.With 66 figs., 6 tabs.
U.S. Sales Only.

The energy-supply-independent after-heat-removal in nuclear propulsion plants for ships in combination with sinking and cantering are analysed with a numeric simulation model. Inclination on the seaground are < 90 deg to the vertical. Different heat-transfer-mechanism in and out of the reactor vessel and at the structures of the containment are analysed. The computer calculation shows that in the course of the accident melting of the core at each inclination occurs. Nevertheless no melting of the reactor vessel occurs due to good cooling of the outer wall of the vessel with seawater. (ERA citation 10:011096)

21G. Reciprocating Engines

536,990
AD-A153 680/4/GAR PC **A04**/MF **A01**
Army Belvoir Research and Development Center, Fort Belvoir, VA.
Development of a High-Temperature Coolant for Advanced Diesel Engines.
Final rept.,
I. S. Rhee. Nov 84, 55p Rept no. BRDC-2415

This study sought to develop a high-temperature coolant for future advanced military diesel engines capable of operating at high temperatures (up to 150 C). The desirable coolant for high-temperature application must have a high boiling point, a low freezing point, good thermal properties (specific heat and thermal conductivity) and must be able to protect the various metals of the cooling system and the engine components against corrosion. In order to evaluate the candidate for high-temperature application under laboratory conditions, the simulated service corrosion test, ASTM D-2570 was conducted at 121 C for 1064 h. Also with this corrosion test mock-up, the cavitation-corrosion test was performed using an aluminum water pump at 121 C for 700 h. The antifreezes used in these tests were mixtures of MIL-A-46153 antifreeze and water containing 50, 60, and 80 wt percent ethylene glycol and similar mixtures containing the antifreeze extender additive, MIL-A-53009. Based on simulated service test results, the antifreeze mixtures containing 50, 60, and 80 wt percent ethylene glycol with antifreeze extender additive were found to be acceptable as potential candidates for the future advanced diesel engine operating at 121 C. Among the three candidate coolants, the antifreeze mixture containing 60 wt percent of MIL-A-46153 with antifreeze extender additive proved to be the optimum coolant for high-temperature

application (121 C) based on its boiling point, freezing point, and thermal properties and on the results of the simulated service corrosion and cavitation-corrosion tests.

536,991
PB85-861839/GAR PC **N01/MF N01**
National Technical Information Service, Springfield, VA.
Internal Combustion Engine Fuel Controls. 1970-June 1985 (Citations from the U. S. Patent Data Base).
Rept. for 1970-Jun 85.
Jun 85, 137p

This bibliography contains citations of selected patents concerning fuel control devices, and methods used to regulate speed and load in internal combustion engines. Techniques utilized to control air-fuel ratios by sensing pressure, temperature, and exhaust composition, and the employment of electronic and feedback devices are discussed. Methods used for engine protection and optimum fuel conservation are considered. (Contains 167 citations fully indexed and including a title list.)

21I. Rocket Propellants

536,992
AD-A153 546/7/GAR PC **A03/MF A01**
Naval Postgraduate School, Monterey, CA.
Holographic Investigation of Solid Propellant Combustion in a Two-Dimensional Motor.
Master's thesis,
Y. Lee. Sep 84, 39p

This investigation continued the development of a method for obtaining high quality holograms of the combustion products from metallized solid rocket motor propellants burned in a two-dimensional motor to provide a cross-flow environment. The use of borosilicate side plates as a motor casting allowed good quality holograms to be obtained. With the present two-dimensional motor method there were upper limits of combustion pressure and weight percentage of aluminum where holograms could not be obtained because of excessive smoke opacity.

22.
SPACE TECHNOLOGY

22A. Astronautics

536,993
AD-A153 691/1/GAR PC **A12/MF A01**
Hughes Aircraft Co., El Segundo, CA. Space and Communications Group.
LFMR Definition Study.
Final rept.
Apr 85, 267p
Contract N00014-84-C-2290

This is the final report of the LFMR definition study. The study was commissioned to evaluate the risks associated with fabrication of a flight qualified LFMR for the NROSS mission. Trade-off studies were performed to determine the impact of the LFMR on the S/C subsystem and the other instruments. The study identified no technological risks in the fabrication and testing of the LFMR. However, dynamic balancing, flexible body interaction, and antenna pointing are areas of concern that need to be closely monitored during the design, fabrication, and test of the sensor. The report is divided into four major areas: System Engineering; Antenna Subsystem, Dynamics, and Balancing.

22B. Spacecraft

536,994
AD-A153 822/2/GAR PC **A06/MF A01**
Old Dominion Univ., Norfolk, VA. Dept. of Mechanical Engineering and Mechanics.
Finite Element Thermal-Structural Analysis of Cable-Stiffened Space Structures.
Final rept. 1 Jun-31 Dec 82,
E. A. Thornton, and A. K. Pandy. Oct 84, 107p
AFWAL-TR-84-3079
Contract F33615-82-K-3219

Finite element thermal-structural analyses of cable-stiffened space structures are presented. A computational scheme for calculation of prestresses in the cable-stiffened structures is also described. The determination of thermal loads on orbiting space structures due to environmental heating is described briefly. Three finite element structural analysis techniques are presented for the analysis of prestressed structures. Linear, stress stiffening and large displacement analysis techniques are investigated. The three techniques are employed for analysis of prestressed cable structures at different prestress levels. The analyses produce similar results at small prestress but at higher prestress, differences between the results become significant. For the cable-stiffened structures studied, the linear analysis technique may not provide acceptable results. The stress stiffening analysis technique may yield results of acceptable accuracy depending on the prestress. The large displacement analysis technique produces accurate results over a wide range of prestresses and is recommended as a general analysis technique for thermal-structural analysis of cable-stiffened space structures.

536,995
PB85-195279/GAR PC **A03/MF A01**
National Environmental Satellite, Data, and Information Service, Washington, DC.
Space Station Polar Platform: Integrating Research and Operational Missions,
J. H. McElroy, and S. R. Schneider. Jan 85, 27p
NOAA-TR-NESDIS-19
See also PB85-177624.

This report describes how an operational payload proposed by NOAA for the Space Station Polar Platform may be merged together with the research sensors scheduled to be carried on the Platform as part of NASA's 'Earth Observing System' (EOS). This is the third in a series of NOAA/NESDIS Technical Reports on the Space Station project. Issues addressed include studies of solar-terrestrial interactions, as well as monitoring of the Earth's atmosphere, oceans and land masses using both operational and R&D sensors.

22C. Spacecraft Trajectories and Reentry

536,996
AD-A153 517/8/GAR PC **A02/MF A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Differential Correction for Near-Stationary Satellites.
Journal article,
L. G. Taff, and J. N. Sorvari. 1982, 10p JA-5099, ESD-TR-85-041
Contract F19628-80-C-0002
Pub. in Celestial Mechanics, v26 p423-431 1982.

This paper presents a new concept for the differential correction of satellite orbits. It is developed in detail for the case of near-stationary artificial satellites. For these satellites a few (<10) observations over a short time interval allows the reacquisition of a satellite an hour later. Moreover, the addition of only a few more observations spanning a slightly longer time interval allows the production of an excellent set of orbital elements. The technique is self-starting and does not use any of the classical initial orbit determination procedures. It can be used for radar observations or extended to include angular velocity data. Its success appears to be based on the ability to find a coordinate system in which the object's motion is nearly stationary and the extensive use of analytical (instead of numerical) procedures.

536,997
AD-A153 803/2/GAR PC **A04/MF A01**
Naval Surface Weapons Center, Dahlgren, VA.
Program KMEC (Kozai Mean Element Converter): The Computation of Kozai Mean Orbital Elements Using a Nonsingular Formulation.
Final rept.,
A. D. Parks. Sep 83, 58p Rept no. NSWC/TR-83-135

A geopotential expressed in terms of a nonsingular set of orbital elements is used to iteratively compute Kozai mean orbital elements from either Brouwer mean orbital elements or inertial osculating Cartesian position and velocity vectors. Although the computational procedure is general in nature, KMEC has been tailored to generate Kozai mean orbital element sets for satellites tracked by the MX 1502-DS and modified TRANET II geoceivers.

KEYWORD INDEX

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Index entries in this section are selected to indicate important ideas and concepts presented in a report. When using the keyword index, be sure to look under terms narrower, broader, or related to a particular topic. Although some of the keywords are not selected from a controlled vocabulary of terms, most of them have been selected from the DoD, DoE, NASA, or NTIS controlled vocabularies. The entries are arranged by keyword and then by the NTIS order number.

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AAEC
Thirty-First Annual Report 1982-1983 (for the Australian Atomic Energy Commission Research Establishment).
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Abridged Building Classification (ABC) For Architects Builders Civil Engineers,
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Use of the Thermal Lens Effect for Enhancement of Sensitivity in Molecular Absorption Spectrometry, with Special Reference to the Use of a Pulsed Dye Laser as Source,
PB85-194009/GAR *535,809*

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ED-252 207 *535,436*

Online Catalogs in ARL Libraries. SPEC Kit 96,
ED-252 208 *535,437*

Characteristics of Online Searchers in University Libraries,
ED-252 209 *535,438*

Retrospective Conversion of Music Collection. Project Manual,
ED-252 212 *535,440*

Recommendation to Continue the BRS/After Dark End User Search Service,
ED-252 215 *535,442*

Academic Library Statistics. Fall 1980, Fall 1981, Fall 1982, Fall 1983. Report Number 12-84.
ED-252 238 *535,578*

Evaluation of the Document Delivery Service Provided by University Libraries, Twin Cities Campus, University of Minnesota. Final Report of a Research Project,
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ED-253 238 *535,611*

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ED-253 242 *535,469*

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PB85-196985/GAR 536,902

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DE85700279/GAR 535,848

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Economics of Information in Education. ERIC Digest.
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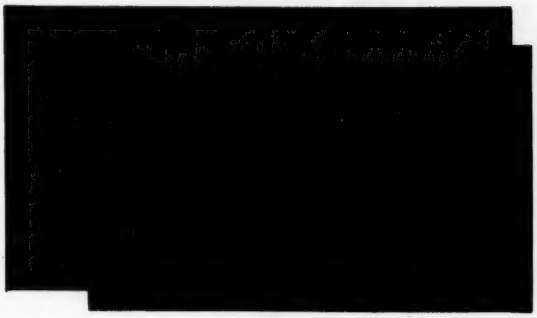

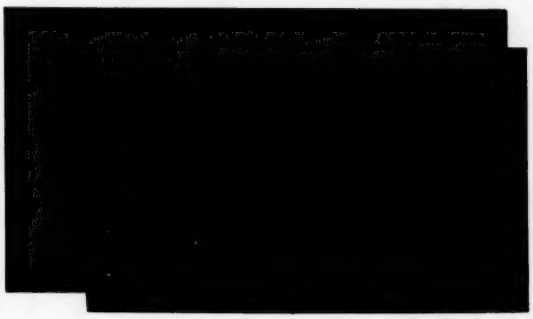

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Toronto Univ., Downsview (Ontario). Inst. for Aerospace Studies.
AD-A153 951/9/GAR 536,760

AFOSR-81-0149
California Univ., Santa Barbara. Dept. of Chemistry.
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AFOSR-82-0016
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
AD-A153 756/2/GAR 535,825
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AFOSR-82-0033
Texas A and M Univ., College Station. Dept. of Electrical Engineering.
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AFOSR-82-0046
Rochester Univ., NY. Dept. of Chemistry.
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Wisconsin Univ.-Madison. Dept. of Computer Sciences.
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Oklahoma State Univ., Stillwater. Dept. of Chemistry.
AD-A153 912/1/GAR 535,836

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Polytechnic Inst. of New York, Farmingdale. Dept. of Electrical Engineering.
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AID/DSAN-CA-0160
National Association of Schools of Public Affairs and Administration, Washington, DC.
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Water and Sanitation for Health Project, Arlington, VA.
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PB85-187011/GAR 535,359

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PB85-192078/GAR 535,645

AID-497-79-100-23
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PB85-192110/GAR 535,722

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DE85008934/GAR 535,767
DE85009645/GAR 535,768

AS05-79ER10489
Tennessee Technological Univ., Cookeville. Dept. of Chemistry.
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DE85009041/GAR 535,643

AT06-76ET11286
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DE85006952/GAR 536,957

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AD-A153 551/7 536,377

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DAAG29-82-K-0005
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DAAG29-82-K-0006
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Williams (Verle A.) and Associates, Inc., San Diego, CA.
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Carnegie Museum of Natural History, Pittsburgh, PA.
AD-A153 688/7/GAR 535,507
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South Carolina Wildlife and Marine Resources Dept., Charleston. Marine Resources Div.
AD-A153 478/3/GAR 535,907
DAJA37-81-C-0002
Erlangen-Nuernberg Univ. (Germany, F.R.). Inst. fuer Angewandte Physik.
AD-A153 664/8/GAR 536,925
DAJA37-81-C-0020
Wisconsin Univ.-Madison. Mathematics Research Center.
AD-A153 521/0/GAR 536,178
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Wisconsin Univ.-Madison. Mathematics Research Center.
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Salford Univ. (England).
AD-A153 891/7/GAR 535,835
DAJA45-83-C-0012
Technische Hochschule Darmstadt (Germany, F.R.). Inst. fuer Hochfrequenztechnik.
AD-A153 650/7/GAR 535,819
DAJA45-83-C-0021
Vrije Univ., Brussels (Belgium). Dept. of Fluid Mechanics.
AD-A153 631/7/GAR 535,304
DAJA45-83-C-0026
University Coll. of North Wales, Bangor. Dept. of Physics.
AD-A153 939/4/GAR 536,734
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University of Western Ontario, London. Dept. of Biochemistry.
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Yale Univ., New Haven, CT. Dept. of Computer Science.
AD-A153 464/3/GAR 536,173
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Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
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NUREG/CR-4031-V2/GAR 536,616
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DE-AC05-760R0033
National Oceanic and Atmospheric Administration, Oak Ridge, TN. Atmospheric Turbulence and Diffusion Div.
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PB85-191153/GAR 536,293

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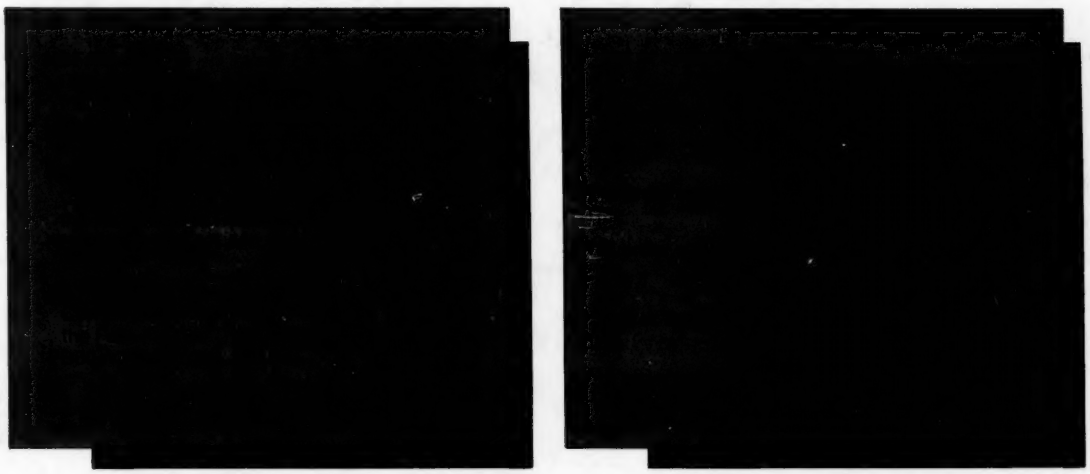

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HRP-0906139/1/GAR *535,687* PC **A12/MF A01**

HRP-0906140/9/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Mississippi.
HRP-0906140/9/GAR *535,687* PC **A12/MF A01**

HRP-0906141/7/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Missouri.
HRP-0906141/7/GAR *535,687* PC **A16/MF A01**

HRP-0906142/5/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Montana.
HRP-0906142/5/GAR *535,687* PC **A09/MF A01**

HRP-0906143/3/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Nebraska.
HRP-0906143/3/GAR *535,687* PC **A13/MF A01**

HRP-0906144/1/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Nevada.
HRP-0906144/1/GAR *535,687* PC **A04/MF A01**

HRP-0906145/8/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New Hampshire.
HRP-0906145/8/GAR *535,687* PC **A03/MF A01**

HRP-0906146/6/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New Jersey.
HRP-0906146/6/GAR *535,687* PC **A05/MF A01**

HRP-0906147/4/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New Mexico.
HRP-0906147/4/GAR *535,687* PC **A06/MF A01**

HRP-0906148/2/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New York.
HRP-0906148/2/GAR *535,687* PC **A09/MF A01**

HRP-0906149/0/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of North Carolina.
HRP-0906149/0/GAR *535,687* PC **A14/MF A01**

HRP-0906150/8/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of North Dakota.
HRP-0906150/8/GAR *535,687* PC **A08/MF A01**

HRP-0906151/6/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Ohio.
HRP-0906151/6/GAR *535,687* PC **A13/MF A01**

HRP-0906152/4/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Oklahoma.
HRP-0906152/4/GAR *535,687* PC A11/MF A01

HRP-0906153/2/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Oregon.
HRP-0906153/2/GAR *535,687* PC A08/MF A01

HRP-0906154/0/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Pennsylvania.
HRP-0906154/0/GAR *535,687* PC A10/MF A01

HRP-0906155/7/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Rhode Island.
HRP-0906155/7/GAR *535,687* PC A03/MF A01

HRP-0906156/5/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of South Carolina.
HRP-0906156/5/GAR *535,687* PC A06/MF A01

HRP-0906157/3/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of South Dakota.
HRP-0906157/3/GAR *535,687* PC A10/MF A01

HRP-0906158/1/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Tennessee.
HRP-0906158/1/GAR *535,687* PC A13/MF A01

HRP-0906159/9/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Texas.
HRP-0906159/9/GAR *535,687* PC A99/MF E04

HRP-0906160/7/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Utah.
HRP-0906160/7/GAR *535,687* PC A08/MF A01

HRP-0906161/5/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Vermont.
HRP-0906161/5/GAR *535,687* PC A04/MF A01

HRP-0906162/3/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Virginia.
HRP-0906162/3/GAR *535,687* PC A14/MF A01

HRP-0906163/1/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Washington.
HRP-0906163/1/GAR *535,687* PC A07/MF A01

HRP-0906164/9/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of West Virginia.
HRP-0906164/9/GAR *535,687* PC A09/MF A01

HRP-0906165/6/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Wisconsin.
HRP-0906165/6/GAR *535,687* PC A11/MF A01

HRP-0906166/4/GAR
Selected Geographic Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Wyoming.
HRP-0906166/4/GAR *535,687* PC A05/MF A01

HRP-0906167/2/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Alabama.
HRP-0906167/2/GAR *535,688*
See individual report for order number and price

HRP-0906168/0/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Alaska.
HRP-0906168/0/GAR *535,688* PC A02/MF A01

HRP-0906169/8/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Arizona.
HRP-0906169/8/GAR *535,688* PC A04/MF A01

HRP-0906170/6/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Arkansas.
HRP-0906170/6/GAR *535,688* PC A14/MF A01

HRP-0906171/4/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of California.
HRP-0906171/4/GAR *535,688* PC A11/MF A01

HRP-0906172/2/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Colorado.
HRP-0906172/2/GAR *535,688* PC A12/MF A01

HRP-0906173/0/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Connecticut.
HRP-0906173/0/GAR *535,688* PC A03/MF A01

HRP-0906174/8/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Delaware.
HRP-0906174/8/GAR *535,688* PC A02/MF A01

HRP-0906175/5/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the District of Columbia.
HRP-0906175/5/GAR *535,688* PC A02/MF A01

HRP-0906176/3/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Florida.
HRP-0906176/3/GAR *535,688* PC A13/MF A01

HRP-0906177/1/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Georgia.
HRP-0906177/1/GAR *535,688* PC A99/MF A01

HRP-0906178/9/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Hawaii.
HRP-0906178/9/GAR *535,688* PC A03/MF A01

HRP-0906179/7/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Idaho.
HRP-0906179/7/GAR *535,688* PC A09/MF A01

HRP-0906180/5/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Illinois.
HRP-0906180/5/GAR *535,688* PC A18/MF A01

HRP-0906181/3/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Indiana.
HRP-0906181/3/GAR *535,688* PC A17/MF A01

HRP-0906182/1/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Iowa.
HRP-0906182/1/GAR *535,688* PC A18/MF A01

HRP-0906183/9/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Kansas.
HRP-0906183/9/GAR *535,688* PC A15/MF A01

HRP-0906184/7/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Kentucky.
HRP-0906184/7/GAR *535,688* PC A21/MF A01

HRP-0906185/4/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Louisiana.
HRP-0906185/4/GAR *535,688* PC A12/MF A01

HRP-0906186/2/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Maine.
HRP-0906186/2/GAR *535,688* PC A05/MF A01

HRP-0906187/0/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Maryland.
HRP-0906187/0/GAR *535,688* PC A06/MF A01

HRP-0906188/8/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Massachusetts.
HRP-0906188/8/GAR *535,688* PC A04/MF A01

HRP-0906189/6/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Michigan.
HRP-0906189/6/GAR *535,688* PC A15/MF A01

HRP-0906190/4/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Minnesota.
HRP-0906190/4/GAR *535,688* PC A18/MF A01

HRP-0906191/2/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Mississippi.
HRP-0906191/2/GAR *535,688* PC A15/MF A01

HRP-0906192/0/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Missouri.
HRP-0906192/0/GAR *535,688* PC A20/MF A01

HRP-0906193/8/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Montana.
HRP-0906193/8/GAR *535,688* PC A11/MF A01

HRP-0906194/6/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Nebraska.
HRP-0906194/6/GAR *535,688* PC A17/MF A01

HRP-0906195/3/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Nevada.
HRP-0906195/3/GAR *535,688* PC A06/MF A01

HRP-0906196/1/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New Hampshire.
HRP-0906196/1/GAR *535,688* PC A04/MF A01

HRP-0906197/9/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New Jersey.
HRP-0906197/9/GAR *535,688* PC A05/MF A01

HRP-0906198/7/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New Mexico.
HRP-0906198/7/GAR *535,688* PC A07/MF A01

HRP-0906199/5/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of New York.
HRP-0906199/5/GAR *535,688* PC A12/MF A01

HRP-0906200/1/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of North Carolina.
HRP-0906200/1/GAR *535,688* PC A18/MF A01

HRP-0906201/9/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of North Dakota.
HRP-0906201/9/GAR *535,688* PC A10/MF A01

HRP-0906202/7/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Ohio.
HRP-0906202/7/GAR *535,688* PC A16/MF A01

HRP-0906203/5/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Oklahoma.
HRP-0906203/5/GAR *535,688* PC A14/MF A01

HRP-0906204/3/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Oregon.
HRP-0906204/3/GAR *535,688* PC A08/MF A01

HRP-0906205/0/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Pennsylvania.
HRP-0906205/0/GAR *535,688* PC A13/MF A01

HRP-0906206/8/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Rhode Island.
HRP-0906206/8/GAR *535,688* PC A03/MF A01

HRP-0906207/6/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of South Carolina.
HRP-0906207/6/GAR *535,688* PC A09/MF A01

HRP-0906208/4/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of South Dakota.
HRP-0906208/4/GAR *535,688* PC A13/MF A01

HRP-0906209/2/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Tennessee.
HRP-0906209/2/GAR *535,688* PC A17/MF A01

HRP-0906210/0/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Texas.
HRP-0906210/0/GAR *535,688* PC A99/MF E06

HRP-0906211/8/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Utah.
HRP-0906211/8/GAR *535,688* PC **A07/MF A01**

HRP-0906212/6/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Vermont.
HRP-0906212/6/GAR *535,688* PC **A04/MF A01**

HRP-0906213/4/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Virginia.
HRP-0906213/4/GAR *535,688* PC **A10/MF A01**

HRP-0906214/2/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Washington.
HRP-0906214/2/GAR *535,688* PC **A08/MF A01**

HRP-0906215/9/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of West Virginia.
HRP-0906215/9/GAR *535,688* PC **A11/MF A01**

HRP-0906216/7/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Wisconsin.
HRP-0906216/7/GAR *535,688* PC **A14/MF A01**

HRP-0906217/5/GAR
Geographic Trends in Resources from the Bureau of Health Profession's Area Resource File (ARF) System for the State of Wyoming.
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